MAG REGIONAL FREEWAY BOTTLENECK STUDY

TASK 5
TRAFFIC DATA WORKING PAPER

MAY 7, 2002

***Submitted to*:**
THE MARICOPA ASSOCIATION OF GOVERNMENTS

***Prepared by*:**

OLSSON ASSOCIATES

TRAFFIC DATA WORKING PAPER

An extensive amount of traffic data was collected for the Regional Freeway Bottleneck Study. The data was collected to meet two objectives:

- To have one representative 24-hour estimate of directional traffic volumes on approximately every three miles of the freeway mainline

- To collect the traffic data necessary to evaluate the bottleneck locations.

Traffic data was collected through an aerial photo-survey flown by Skycomp, Inc., video photography using both the ADOT Freeway Management System (FMS) cameras and portable cameras operated by ATD Northwest (ATD), and manual counts set by Traffic Research & Analysis (TRA). Data collection began on September 11, 2001 and continued into October. The methodology followed and the results of each are discussed in this chapter.

The data collection tasks of the Regional Freeway Bottleneck Study resulted in four products:

- An aerial photo-survey report, *Traffic Quality on the MAG Regional Freeway System*, prepared by Skycomp;

- A traffic data validation binder of data, prepared by Olsson Associates (because of its size, just one copy was prepared);

- An MS Access traffic count database, also prepared by Olsson Associates;

- A series of maps presenting the data, which are included in this working paper.

NOTE: THE TEXT OF THIS WORKING PAPER DOCUMENTS THE PROCESSES FOR COLLECTING, VALIDATING, AND REPORTING THE TRAFFIC DATA. THE COUNT DATA IS PRESENTED IN A SERIES OF MAPS IN APPENDIX C OF THE WORKING PAPER.

- *2001 Daily Traffic Volume (Figures 1 and 1A)*
- *2001 Daily HOV Lane Volume (Figure 2)*
- *2001 AM Peak Hour Traffic Volume (Figures 3 and 3A)*
- *2001 PM Peak Hour Traffic Volume (Figures 4 and 4A)*
- *2001 AM Peak Hour HOV Lane Volume (Figure 5)*
- *2001 PM Peak Hour HOV Lane Volume (Figure 6)*
- *2001 Daily Truck Volume (Figure 7)*
- *2001 AM Peak Hour Truck Volume (Figure 8)*
- *2001 PM Peak Hour Truck Volume (Figure 9)*

APPENDICES D, E AND F DEPICT THE DAILY, MORNING PEAK AND EVENING PEAK VARIATION IN TRAFFIC VOLUMES ON I-10 WB BETWEEN RIGGS ROAD AND OGLESBY ROAD

AERIAL PHOTO-SURVEY

In the fall of 2001, Skycomp conducted a series of aerial photo-surveys of highway traffic conditions in the planning region of the Phoenix metropolitan area. The purpose was to update information on traffic conditions and obtain other materials to support regional planning activities. Using the mobility and vantage point of fixed-wing aircraft, a photographic inventory of traffic conditions was made on approximately 175 miles of freeways during the peak morning and evening periods of commuter travel.

In the fall of 1998, a similar survey of the MAG regional freeway system was conducted, with approximately 110 miles of highway included. The 2001 survey was conducted using the same methodology, except that survey coverage was expanded by one hour for both the morning and evening peak periods.

During this aerial survey program, overlapping photographic coverage of designated freeways was obtained – repeated once an hour over four morning and four evening commuter periods. The morning times of coverage were 6:00-9:00 AM, and evening times were 3:30-6:30 PM Survey flights were conducted only on weekdays, except that Monday mornings, Friday evenings, and mornings after holidays were excluded. Data were extracted from the aerial photographs such that, by link and by time slice, average recurring daily traffic conditions could be measured.

The *Traffic Quality on the MAG Regional Freeway System* report, prepared by Skycomp as a product of its efforts, presents the aerial photo-survey data in the following ways:

- Performance rating tables of traffic conditions on the 175 miles of surveyed freeways are presented for morning and evening peak periods. The ratings are presented in tables by highway segment, by direction, and by time slice. Each rating represents the average of approximately four flyovers (from four different days), minus any data affected by incidents (the half-hour time slices represent the average of two flyovers). The ratings are density-based level-of-service (LOS) designations "A", "B", "C", "D", "E" and "F", as defined in the *2000 Highway Capacity Manual* (HCM).

- The report also includes highway maps containing narratives that clarify the severity and frequency of all congestion found along each highway segment. Where evident, apparent causes of the problems are also described. Congestion on crossing freeways and on interchange ramps are also depicted and discussed.

Other aerial photo-survey results produced and submitted to MAG include:

- Queue populations at freeway on-ramps (ramp meters) and off-ramps (signal queues) have been recorded for each observation. Each entry also includes physical

characteristics of the ramp, including the number of lanes associated with each turning movement.

- An electronic version of the Survey Database (built in Microsoft Access) was produced. This database contains all of the collected data, from vehicle counts and road segmentation, to flight information and the variables used to calculate densities.

- An interactive CD-ROM *Congestion Highlights* slide show presents the findings of the report, plus many highlight aerial photographs of congestion. This product can be projected to audiences "as is"; the interactive feature allows a presenter to respond to audience interests by going to specific locations as they come up in the discussion.

- A second slide show, the *Peak-Traffic Photolog*, contains overlapping photographic coverage of the entire 175-mile system -- twice. Using actual survey photographs, typical peak-hour passes were selected during both morning and evening survey periods. These passes represent a snapshot of how the highway system looked on a typical day (as much as possible, passes were selected that did not include the effects of major incidents).

CAMERA/VIDEO COUNTS

ATD collected traffic data using video photography at 44 locations – 23 ADOT FMS locations and 21 locations where portable cameras were used. Of the 44 sites, 36 were mainline locations, where video was recorded in both directions, and 8 were ramp locations. The locations, type of camera used (FMS or portable), date the data was collected, and data prepared from the videos are provided in Appendix A. Ramp metering sites that were operational in September 2001 are listed in Appendix B.

The camera location counts utilized videotapes and a sampling procedure. The videotapes were viewed and the vehicles were manually counted for five-minute intervals for 20 hours, 4:00 AM to 12:00 midnight. From 4:00 to 6:00 AM, the first five-minute interval of each hour was counted. From 6:00 to 9:00 AM, the first five-minute interval of each fifteen minutes was counted. From 9:00 AM to 3:00 PM, the first five-minute interval of each hour was counted. From 3:30 to 6:15 PM, the first five-minute interval of each fifteen minutes was counted. From 7:00 PM to midnight, the first five-minute interval of each hour was counted.

The camera location counts were expanded to a full 24-hour volume. Each five-minute interval counted was multiplied by three to obtain an estimated 15-minute volume. During the periods when a five-minute interval was counted once per hour (off-peak hours), the 15-minute volume was utilized four times to represent a one-hour volume. The volumes for the time period from midnight to 4:00 AM were estimated by utilizing counts from similar stations with complete twenty-four hour counts – either tube or loop counts.

MANUAL COUNTS

TRA was responsible for all manual counts. Directional manual counts were collected by either pneumatic tubes (117 sites) or, when available and functional, using permanent loops (34 sites). The locations and data prepared at each location are also provided in Appendix A.

In summary, 233 ground directional traffic counts were obtained from four different sources. Arizona Department of Transportation Freeway Management System video cameras were utilized for 46 counts. ATD Northwest cameras were utilized for 36 counts. Pneumatic tubes were utilized for 117 counts. Arizona Department of Transportation permanent detector loops were utilized for 34 counts. One hundred sixteen tube and fifteen loop locations were counted for 15-minute intervals over a 48-hour period. One tube location and nineteen loop locations were counted for one-hour intervals over a 48-hour period.

COUNT VALIDATION PROCESS

With the large number of ground counts collected and counts coming from a variety of sources, it was important to critically investigate the counts to ensure the validity of the data. The validation process is discussed in this section.

All of the graphics and charts prepared and evaluated in the validation process were inserted into a three-ring binder and submitted to MAG. All attachments referred to in this section are included in the binder. Attachment 1 in the binder is the Data Collection Plan map.

Initial Inspection

In order to assess the reasonability of the data, the counts for each individual location were plotted. The standard plot consisted of a solid diamond connected by a solid line. Those locations with 15-minute counts were plotted in both 15-minute intervals and one-hour intervals. Those counts with five-minute counts were expanded to 15-minute intervals and plotted in both 15-minute and one-hour intervals. The camera counts that were expanded to 15-minute interval volumes for 24 hours were plotted with a long dashed line and an asterisk.

The locations with 48 hours of volume data were carefully examined. An average 24-hour total was calculated. If apparent differences occurred between the two 24-hour periods, then separate 24-hour totals were calculated for each day. If differences greater than 1,000 vehicles per day occurred between the average daily volume and the highest daily volume, the higher daily volume data was utilized. The plot of the discarded daily volume was changed to a short dashed line and an open diamond.

Attachment 2 (in binder) is a listing of the count stations that required traffic volume adjustments. Attachment 3 (in binder) is the individual plots of the fifteen-minute and hourly volumes for each of the 233 count stations.

Subsequent Inspection

Thirteen separate maps of mainline freeways were developed. The daily traffic counts were rounded to the nearest 500 vehicles per day and indicated on the maps. These counts were reviewed for logical progression. For example, US-60 experiences low traffic volumes in each direction at its eastern terminus. The traffic volumes increase in the western direction. Each count on each facility was examined from a similar perspective to ensure logical increase or decreases.

Nine separate maps of freeway-to-freeway interchanges were developed. The entering and exiting traffic counts were examined to ensure logical increases or decreases. Where possible, the percent difference between the measured counts and calculated counts was determined. The measured counts were at the approaches and departures of each interchange. The calculated counts began with the approach count, subtracted exit ramp counts and added entrance ramp counts resulting in a departure volume. The percent difference was determined as the difference between the counts divided by the average of the counts.

The percent difference at each of the count locations for all of the interchanges was relatively small. A percent difference between the measured count and the calculated count of 10% or less is accepted as valid. All but two interchanges had a percent difference of less than 10%. Considering that three different counting devices were utilized, and that counts occurred on different days of the week and months of the year, it is exceptional that the counts balanced within 10% or less for all but two locations. One interchange – I-10 to SR-101 – had a percent difference for the westbound traffic of 18%. Another interchange – I-10 to SR-202 to SR-51 – had a southbound percent difference of 11%.

At three freeway-to-freeway interchanges, it was not possible to calculate percent differences as the count stations were too far from the interchanges. At these locations, several entrance and exit ramps were present between the freeway-to-freeway interchanges and the closest count station. These interchanges were: I-17 to SR-101, I-17 to I-10, and SR-101 to SR-202. At these interchanges, some of the approach and departure volumes were calculated based on the exiting and entering counts at the freeway-to-freeway interchanges.

Attachment 4 (in binder) is a series of maps that provide the directional daily traffic volumes rounded to the nearest 500 vehicles and the count stations in various subsections of the freeway system. Attachment 5 (in binder) is a single map that provides the daily traffic volumes rounded to the nearest 1,000 vehicles for the entire freeway system.

In summary, the careful examination of the traffic counts verified the validity of the counts for future analysis.

MS ACCESS TRAFFIC COUNT DATABASE

The relational Traffic Count Database (MS Access) was compiled from three principal tables:

1. Count Sites
2. Counts-All Sites
3. Peak Periods & Hours-All Sites

The *Count Sites* table consists of one record for each count location/direction (totaling 791 records). Each record is uniquely identified by a Site ID. Each record fully identifies and describes a single site: its freeway, direction, location, the name of the file containing its counts, the date on which the counts were taken, the number of counts in the file, its count intervals (15-minute or 1-hour), etc.

The *Counts - All Sites* table contains the actual traffic count values for each site spanning a period of 24 hours in 15-minute increments. Thus the table contains 96 count records (24 hours times four 15-minute periods per hour) for each count site. The table is related to the *Count Sites* table via field the Site ID. This table includes fields for Total Volume, General Purpose Lanes Volume, HOV Lane Volume, Volumes in Lanes 1-6, and Class Volumes (for Light Duty, Medium Duty, and Heavy Duty Vehicles). Not all of these volume types are included for every count site. For example, relatively few of the count sites collected classification volumes. The table contains blanks wherever information was not collected.

The *Peak Periods & Hours - All Sites* table contains a single record for each count site (791 records), and again relates to the other tables via the Site ID. This table contains summed count volumes for four periods during the day: the AM Period (6:00 AM - 9:00 AM), the Mid Day Period (9:00 AM - 3:00 PM), the PM Period (3:00 PM - 6:00 PM), and the Night Period (6:00 PM - 6:00 AM). The table gives Total Volumes, General Purpose Lanes Volumes, and HOV Lane Volumes over each of these periods. The table also gives the Peak Hour (e.g.- 8:00 AM - 9:00 AM) during which the highest volume occurred in both the AM Period and the PM period.

The Traffic Count Database contains a number of smaller tables that are subsets of the *Counts - All Sites* table. The name of each of these subset tables begins with "Counts." For example, the table named *Counts - Mainline By Class* includes only count values for count sites at which Class volumes were collected.

APPENDIX A

DATA COLLECTION INFORMATION

Mainline Camera Site Locations:

Site #	Fwy	Between	Camera Type	Date	Direction	Data
1	I-10	Ray Rd. and Chandler Blvd.	ATD	Tue, 9/11	Both	Total Volume (TV)
2	I-10	Elliot Rd. and Warner Rd.	ATD	Tue, 9/11	Both	TV, Classification (Class)
3	I-10	Broadway Rd. and US-60	ATD	Tue, 9/11	Both	TV by Lane
4	I-10	32nd St. and 40th St.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV
5	I-17	16th St. and 24th St.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV, Class
6	I-17	Buckeye Rd. and 19th Ave.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV
7	I-17	I-10 and Van Buren St.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV
8	I-17	Camelback Rd. and Indian School Rd.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV
9	I-17	Northern Ave. and Glendale Ave.	FMS	Tue, Wed 9/11,9/12	EB, WB	TV, Class
10	US-60	Cooper Rd. and Gilbert Rd.	ATD	Thurs, 9/13	Both	TV
11	US-60	Country Club Dr. and Mesa Dr.	ATD	Thurs, 9/13	Both	TV, Class
12	US-60	I-10 and Priest Rd.	ATD	Thurs, 9/13	Both	TV
13	I-10	SR-202 and Van Buren St.	FMS	Thurs,Tue 9/13,9/18	NB, SB	TV
14	I-10	7th St. and 16th St.	FMS	Thurs,Tue 9/13,9/18	EB, WB	TV by Lane

15	I-10	19th Ave. and 7th Ave.	FMS	Thurs,Tue 9/13,9/18	EB, WB	TV
16	I-10	35th Ave. and 27th Ave.	FMS	Thurs,Tue 9/13,9/18	EB, WB	TV by Lane, Class
17	I-10	59th Ave. and 51st Ave.	FMS	Thurs,Tue 9/13,9/18	EB, WB	TV
18	I-10	83rd Ave. and 75th Ave.	FMS	Thurs,Tue 9/13,9/18	EB, WB	TV, Class
19	SR-101 (E)	Guadalupe Rd. and Elliot Rd.	ATD	Wed, 9/19	Both	TV
20	SR-101 (E)	Broadway Rd. and Southern Ave.	ATD	Wed, 9/19	Both	TV by Lane, Class
21	SR-202	Dobson Rd. and Alma School Rd.	ATD	Wed, 9/19	Both	TV
22	SR-202	32nd St. and 40th St.	FMS	Wed,Thurs 9/19,9/20	EB, WB	TV
23	SR-51	Thomas Rd. and McDowell Rd.	FMS	Wed,Thurs 9/19,9/20	NB, SB	TV by Lane
24	SR-51	Colter Rd. and Camelback Rd.	FMS	Wed,Thurs 9/19,9/20	NB, SB	TV, Class
25	SR-51	Shea Blvd. and Northern Ave (closest)	FMS	Wed,Thurs 9/19,9/20	NB, SB	TV
26	SR-51	Cactus Rd. and Shea Blvd.	FMS	Wed,Thurs 9/19,9/20	NB, SB	TV
27	SR-51	Bell Rd and Greenway Rd	FMS	Wed,Thurs 9/19,9/20	NB, SB	TV
28	SR-101 (E)	SR-202 and University Dr.	ATD	Wed, 9/12	Both	TV

29	SR-101 (E)	McKellips Rd. and SR-202	ATD	Wed, 9/12	Both	TV by Lane, Class
30	SR-101 (E)	Indian School Rd. and Thomas Rd.	ATD	Wed, 9/12	Both	TV
31	SR-101 (W)	Indian School Rd. and Thomas Rd.	ATD	Tue, 9/19	Both	TV
32	I-17	Greenway Rd. and Thunderbird Rd.	ATD	Tue, 9/19	Both	TV, Class
33	I-17	Carefree Hwy and Happy Valley Rd.	ATD	Tue, 9/19	Both	TV
34	SR-202	Center Pkwy. and Scottsdale Rd.	ATD	Thurs 9/20	Both	TV
35	SR-143	University Dr. and I-10	FMS	Tue, Wed 9/25,9/26	NB, SB	TV
36	SR-143	SR-202 and Van Buren St.	FMS	Tue, Wed 9/25,9/26	NB, SB	TV

System Interchange Camera Site Locations						
Site #	**To**	**From**	**Camera Type**	**Date**	**Direction**	**Data**
37	US-60 on ramp	I-10 SB	ATD	Thurs, 9/20	EB ramp	TV
38	I-10 on ramp NB	US-60 WB	ATD	Thurs, 9/20	NB ramp	TV
39	I-10 on ramp SB	US-60 WB	ATD	Thurs, 9/20	SB ramp	TV
40	US-60 on ramp WB	SR-101 SB	ATD	Thurs, 9/20	WB ramp	TV
41	I-10 on	I-17	FMS	Tue, Wed	EB ramp	TV

	ramp EB	NB and SB		9/25,9/26		
42	I-10 on ramp WB	SR-51 WB	FMS	Tue, Wed 9/25,9/26	WB ramp	TV
43	SR-51 and SR-202	I-10 off ramp EB	FMS	Tue, Wed 9/25,9/26	EB ramp	TV
44	SR-202 on ramp WB	SR-101 WB	ATD	Thurs, 9/20	WB ramp	TV

Mainline Tube Site Locations:

Site #	Fwy	Between	Date	Direction	Data
45	I-10	Oglesby Rd. and Miller Rd.		Both	TV
46	I-10	East of Miller Rd.		None – duplicate station	
47	I-10	West of Jackrabbit Rd.		Both	TV
48	I-10	Jackrabbit Tr. and Citrus Rd.		Both	TV
49	I-10	Cotton Lane and Estrella Pkwy.		Both	TV
50	I-10	Litchfield Rd. and Dysart Rd.		Both	Tv
51	I-10	115th Ave. and 107th Ave.		Both	TV
52	I-10	SR-101 and 91st Ave.		Both	TV
53	SR-101	I-10 and Thomas Rd.		Both	TV
54	SR-101	Camelback Rd. and Glendale Ave.		Both	TV

55	I-17	SR-101 and Deer Valley Dr.		Both	TV
56	SR-101	I-17 and 19th Ave.		Both	TV
57	I-17	Carefree Hwy. and Pioneer Rd.		Both	TV
58	I-17	Pioneer Rd. and Anthem Way		Both	TV
59	I-17	New River Rd. and Anthem Way		Both	TV
60	SR-101	7th St. and Cave Creek Rd.		Both	TV
61	SR-101	Cave Creek Rd. and Tatum Blvd.		Both	TV
62	SR-101	Tatum Blvd. and Scottsdale Rd.		Both	TV
63	SR-101	Frank Lloyd Wright Blvd. and Cactus Rd.		Both	TV
64	SR-101	Shea Blvd. and Via De Ventura		Both	TV
65	SR-101	Indian Bend Rd. and McDonald Dr.		SB	TV
66	US-60	Val Vista Dr. and Greenfield Rd.		Both	TV
67	US-60	East of Goldfield Rd.		Both	TV
68	I-10	Maricopa Rd. and Queen Creek Rd.		Both	TV
69	I-10	North of Riggs Rd.		Both	TV

System Interchange Tube Site Locations					
Site #	**To**	**From**	**Date**	**Direction**	**Data**
70	I-10 on ramp SB	Baseline Rd.		SB	TV
71	Baseline Rd.	I-10 off ramp NB		NB	TV
72	US-60 on ramp EB	I-10 off ramp NB		NB	TV
73	I-10 on ramp NB	Baseline Rd.		NB	TV
74	US-60 on ramp EB	Baseline Rd.		EB	TV
75	Baseline Rd.	I-10 off ramp SB		SB	TV
76	Broadway Rd.	I-10 off ramp NB		NB	TV
77	I-10 on ramp SB	Broadway Rd.		SB	TV
78	I-10 on ramp WB	Broadway Rd.		WB	TV
79	SR-143 on ramp NB	I-10 off ramp WB		NB	TV
80	I-10 on ramp SB	SR-143 off ramp SB		SB	TV
81	Broadway Rd.	I-10 off ramp SB		SB	TV
82	US-60 on ramp WB	SR-101 off ramp SB		WB	TV
83	SR-101 on ramp SB	US-60 off ramp EB		SB	TV
84	US-60 WB and EB on ramps	SR-101 off ramp NB		NB	TV
85	SR-101 on ramp NB	US-60 off ramp EB		EB	TV
86	US-60 on ramp EB	SR-101 off ramp NB		EB	TV
87	SR-101 on ramp NB	US-60 off ramp WB		WB	TV
88	SR-101 on ramp SB	US-60 off ramp WB		WB	TV
89	US-60 on ramp WB	SR-101 off ramp NB		WB	TV
90	McClintock Dr.	US-60 off ramp WB		WB	TV
91	I-10 on ramp WB	I-17 off ramp SB		WB	TV
92	I-17 on	I-10 off		EB	TV

	ramp NB	ramp EB			
93	I-10 EB and WB on ramps	I-17 off ramp SB		SB	TV
94	I-10 off ramps	I-17 on ramps NB		NB	TV
95	I-17 on ramp SB	I-10 off ramp EB		SB	TV
96	19th Ave.	I-17 off ramp NB		NB	TV
97	I-17 on ramp SB	19th Ave.		SB	TV
98	I-17 on ramp SB	I-10 off ramps		SB	TV
99	I-10 on ramps	I-17 off ramp NB		NB	TV
100	I-17 on ramps	I-10 off ramp WB		WB	TV
101	I-10 WB HOV	SR-202 WB HOV		WB	TV
102	SR-202 EB HOV	I-10 EB HOV		EB	TV
103	I-10 on ramp SB	SR-51 SB		SB	TV
104	SR-51 and SR-202 on ramps	I-10 off ramp NB		NB	TV
105	SR-202 on ramp EB	SR-51 and I-10 off ramps		EB	TV
106	SR-202 EB	I-10 off ramp EB		EB	TV
107	SR-51 on ramp NB	SR-202 off ramp WB		WB	TV
108	SR-51 on ramp NB	SR-202 and I-10 off ramps		NB	TV
109	SR-51 NB	I-10 off ramp NB		NB	TV
110	I-10 on ramp WB	SR-202 off ramp WB		WB	TV
111	I-10 on ramp WB	SR-51 off ramp SB		WB	TV
112	SR-101 on ramp SB	SR-202 off ramps		SB	TV
113	SR-202 on ramps	SR-101 off ramp NB		NB	TV
114	SR-101	8th St.		NB	TV

	NB				
115	8th St.	SR-101 SB		SB	TV
116	SR-101 on ramps	SR-202 off ramp EB		EB	TV
117	SR-202 on ramp EB	SR-101 off ramps		EB	TV
118	SR-101 on ramps	SR-202 off ramp WB		WB	TV
119	SR-101 on ramp NB	SR-202 off ramps		NB	TV
120	SR-202 on ramps	SR-101 off ramp SB		SB	TV
121	SR-202 on ramp WB	SR-143 off ramps		WB	TV
122	SR-143 on ramps	SR-202 off ramp EB		EB	TV
123	SR-143 on ramp SB	SR-202 off ramp EB		SB	TV
124	SR-202 on ramp WB	SR-143 off ramp NB		NB	TV
125	SR-143 on ramp NB	SR-202 off ramp EB		NB	TV
126	SR-202 on ramp WB	SR-143 off ramp SB		SB	TV
127	I-17 on ramp SB	SR-101 off ramps		SB	TV
128	SR-101 on ramps	I-17 off ramp NB		NB	TV
129	I-17 on ramps	SR-101 off ramp EB		EB	TV
130	SR-101 off ramp WB	I-17 off ramps		WB	TV
131	SR-101 on ramps	I-17 off ramp SB		SB	TV
132	I-17 on ramp NB	SR-101 off ramps		NB	TV
133	I-17 on ramps	SR-101 off ramp WB		WB	TV
134	SR-101 on ramp EB	I-17 off ramps		EB	TV
135	SR-101 on ramp NB	I-10 off ramp EB		EB	TV
136	I-10 on ramp WB	SR-101 off ramp SB		WB	TV
137	SR-101 on ramp NB	I-10 off ramp WB		WB	TV
138	I-10 on ramp EB	SR-101 off ramp SB		EB	TV

ADOT Mainline Loop Site Locations					
Site #	**Fwy**	**Between**	**Date**	**Direction**	**Data**
145	SR-101	Olive Ave. and Northern Ave.		Both	TV
146	SR-101	Bell Rd. and Thunderbird Rd.		Both	TV
147	SR-101	67th Ave. and 75th Ave.		Both	TV
148	SR-101	35th Ave. and 51st Ave.		Both	TV
149	I-17	Cactus Rd. and Peoria Ave.		Both	TV
150	I-17	Carefree Hwy and Happy Valley Rd.		Both	TV
151	I-10	Warner Rd. and Ray Rd.		Both	TV
152	I-10	Guadalupe Rd. and Baseline Rd.		Both	TV
153	SR-101	Warner Rd. and Ray Rd.		Both	TV
154	US-60	SR-101 and McClintock Rd.		Both	TV
155	US-60	Dobson Rd. and SR-101		Both	TV
156	US-60	Power Rd. and Sossaman Rd.		Both	TV
157	US-60	Ellsworth Rd. and Crismon Rd.		Both	TV
158	US-60	Ironwood		Both	TV

		Dr. and Signal Butte Rd.			
159	SR-101	McDowell Rd. and McKellips Rd.		Both	TV
160	SR-101	Chaparral Rd. and Indian School Rd.		Both	TV
161	SR-101	Indian Bend Rd. and McDonald Dr.		Both	TV

APPENDIX B

RAMP METERING SITES

HIGHWAY	DIRECTION	CROSS STREET	TIMES
I-10	EB	83rd Avenue	05:30 - 09:00
I-10	EB	75th Avenue	05:30 - 09:00
I-10	EB	67th Avenue	05:30 - 09:00
I-10	EB	59th Avenue	05:30 - 09:00
I-10	EB	51st Avenue	05:30 - 09:00
I-10	EB	43rd Avenue	05:30 - 09:00
I-10	EB	35th Avenue	05:30 - 09:00
I-10	EB	19th Avenue	05:30 - 09:00 15:00 - 19:00
I-10	EB	7th Street	15:00 - 19:00
I-10	EB	Broadway Road	15:00 - 19:00
I-10	EB	Baseline Road	15:00 - 19:00
I-10	WB	Washington Street	15:00 - 19:00
I-10	WB	7th Avenue	15:00 - 19:00
I-10	WB	27th Avenue	15:00 - 19:00
I-10	WB	35th Avenue	15:00 - 19:00
I-10	WB	43rd Avenue	15:00 - 19:00
I-10	WB	51st Avenue	15:00 - 19:00
I-10	WB	59th Avenue	15:00 - 19:00
I-17	NB	Grant Street	15:00 - 19:00
I-17	NB	Adams Street	15:00 - 19:00
I-17	NB	McDowell Road	15:00 - 19:00
I-17	NB	Thomas Road	15:00 - 19:00
I-17	NB	Indian School Road	15:00 - 19:00
I-17	NB	Camelback Road	15:00 - 19:00
I-17	NB	Bethany Home Road	15:00 - 19:00
I-17	NB	Glendale Avenue	15:00 - 19:00
I-17	NB	Northern Avenue	15:00 - 19:00
I-17	NB	Dunlap Avenue	15:00 - 19:00
I-17	NB	Peoria Avenue	15:00 - 19:00
I-17	SB	Greenway Road	05:30 - 09:00
I-17	SB	Thunderbird Road	05:30 - 09:00
I-17	SB	Cactus Road	05:30 - 09:00
I-17	SB	Peoria Avenue	05:30 - 09:00
I-17	SB	Dunlap Avenue	05:30 - 09:00
I-17	SB	Northern Avenue	05:30 - 09:00
I-17	SB	Glendale Avenue	05:30 - 09:00
I-17	SB	Bethany Home Road	05:30 - 09:00
I-17	SB	Camelback Road	05:30 - 09:00
I-17	SB	Indian School Road	05:30 - 09:00
I-17	SB	Thomas Road	05:30 - 09:00
I-17	SB	McDowell Road	05:30 - 09:00

I-17	SB	Grant Street	05:30 - 09:00
SR-51	NB	McDowell Road	14:00 - 19:00
SR-51	NB	Thomas Road	14:00 - 19:00
SR-51	NB	Indian School Road	14:00 - 19:00
SR-51	NB	Colter Street	14:00 - 19:00
SR-51	NB	Bethany Home Road	14:00 - 19:00
SR-51	SB	Cactus Road	05:30 - 09:00
SR-51	SB	26th Street	05:30 - 09:00
SR-51	SB	Northern Avenue	05:30 - 09:00
SR-51	SB	Glendale Avenue	05:30 - 09:00
SR-51	SB	Bethany Home Road	05:30 - 09:00 15:00 - 19:00
SR-51	SB	Highland Avenue	05:30 - 09:00 15:00 - 19:00
SR-51	SB	Indian School Road	05:30 - 09:00 14:00 - 19:00
SR-51	SB	Thomas Road	05:30 - 09:00 14:00 - 19:00
SR-202	EB	24th Street	05:30 - 09:00 15:00 - 19:00
SR-202	EB	32nd Street	05:30 - 09:00 15:00 - 19:00
SR-202	EB	44th Street	05:30 - 09:00 15:00 - 19:00
SR-202	WB	40th Street	05:30 - 09:00 15:00 - 19:00
SR-202	WB	32nd Street	05:30 - 09:00 15:00 - 19:01
SR-202	WB	24th Street	05:30 - 09:00 15:00 - 19:02
SR-101	WB	27th Avenue	14:00 - 19:00
US-60	EB	Priest Drive	14:00 - 19:00
US-60	EB	Mill Avenue	14:00 - 19:00
US-60	EB	Rural Road	14:00 - 19:00
US-60	EB	McClintock Drive	15:00 - 19:00
US-60	EB	Dobson Road	14:00 - 19:00
US-60	EB	Alama School Road	14:00 - 19:00
US-60	EB	Country Club Drive	14:00 - 19:00
US-60	EB	Mesa Drive	14:00 - 19:00
US-60	EB	Stapely Drive	14:00 - 19:00
US-60	EB	Gilbert Road	14:00 - 19:00
US-60	EB	Val Vista Road	14:00 - 19:00
US-60	EB	Greenfield Road	14:00 - 19:00

US-60	EB	Higley Road	14:00 - 19:00
US-60	EB	Power Road	14:00 - 19:00
US-60	WB	Power Road	05:30 - 09:00
US-60	WB	Superstition Blvd	05:30 - 09:00
US-60	WB	Higley Road	05:30 - 09:00
US-60	WB	Greenfield Road	05:30 - 09:00 15:00-18:00
US-60	WB	Val Vista Road	05:30 - 09:00 15:00-18:000
US-60	WB	Gilbert Road	05:30 - 09:00 15:00-18:00
US-60	WB	Stapley Drive	05:30 - 09:00 15:00-18:00
US-60	WB	Mesa Drive	05:30 - 09:00
US-60	WB	Country Club Drive	05:30 - 09:00
US-60	WB	Alma School Road	05:30 - 09:00
US-60	WB	McClintock Drive	05:30 - 09:00
US-60	WB	Rural Road	05:30 - 09:00
US-60	WB	Mill Avenue	05:30 - 09:00

.

MAG REGIONAL FREEWAY BOTTLENECK STUDY

TASK 5
TRAFFIC DATA WORKING PAPER
TRAFFIC VOLUME MAPS
(DRAFT)

MAY 23, 2002

***Submitted to*:**
THE MARICOPA ASSOCIATION OF GOVERNMENTS

***Prepared by*:**

OLSSON ASSOCIATES

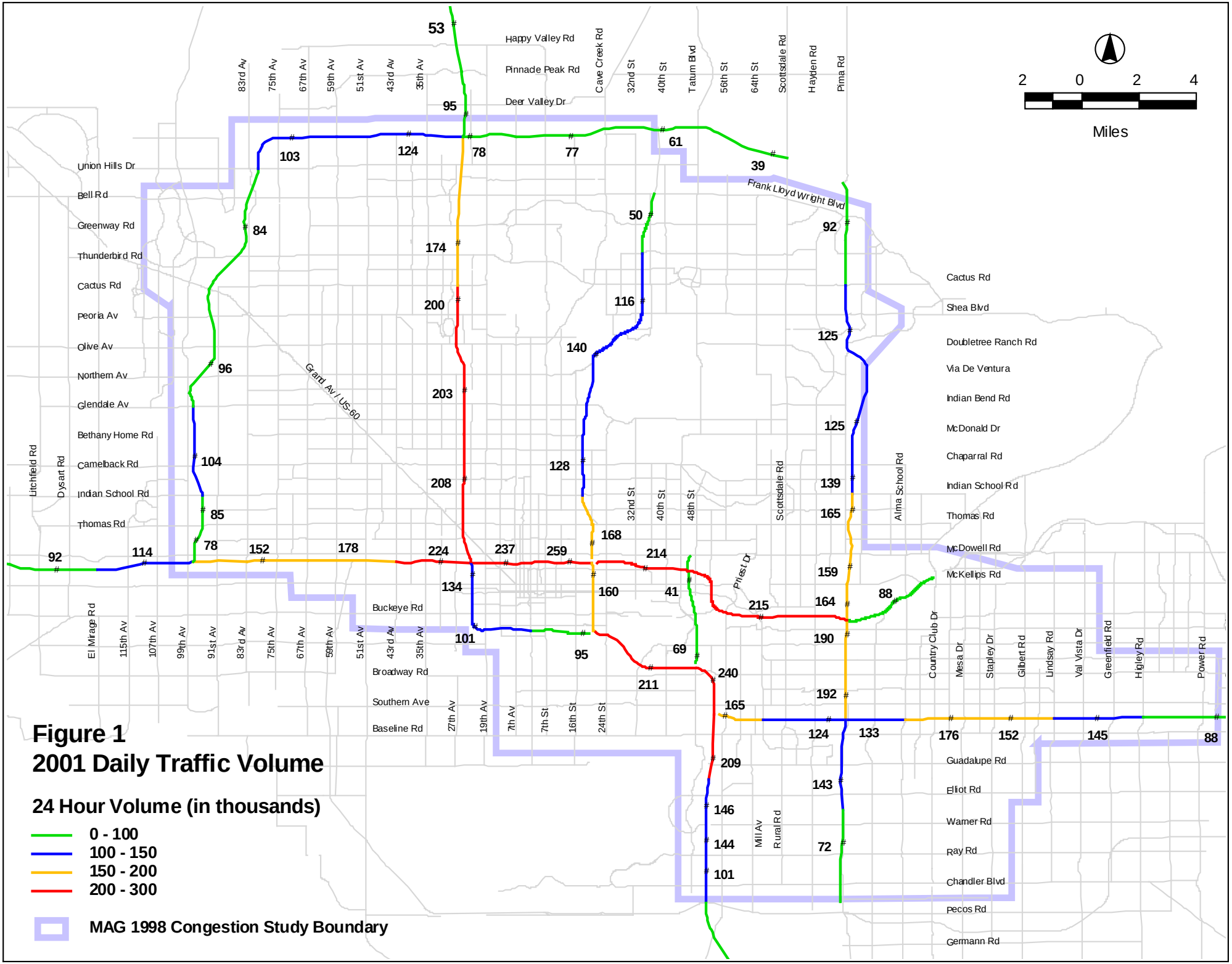


Figure 1
2001 Daily Traffic Volume

24 Hour Volume (in thousands)

- 0 - 100
- 100 - 150
- 150 - 200
- 200 - 300

MAG 1998 Congestion Study Boundary

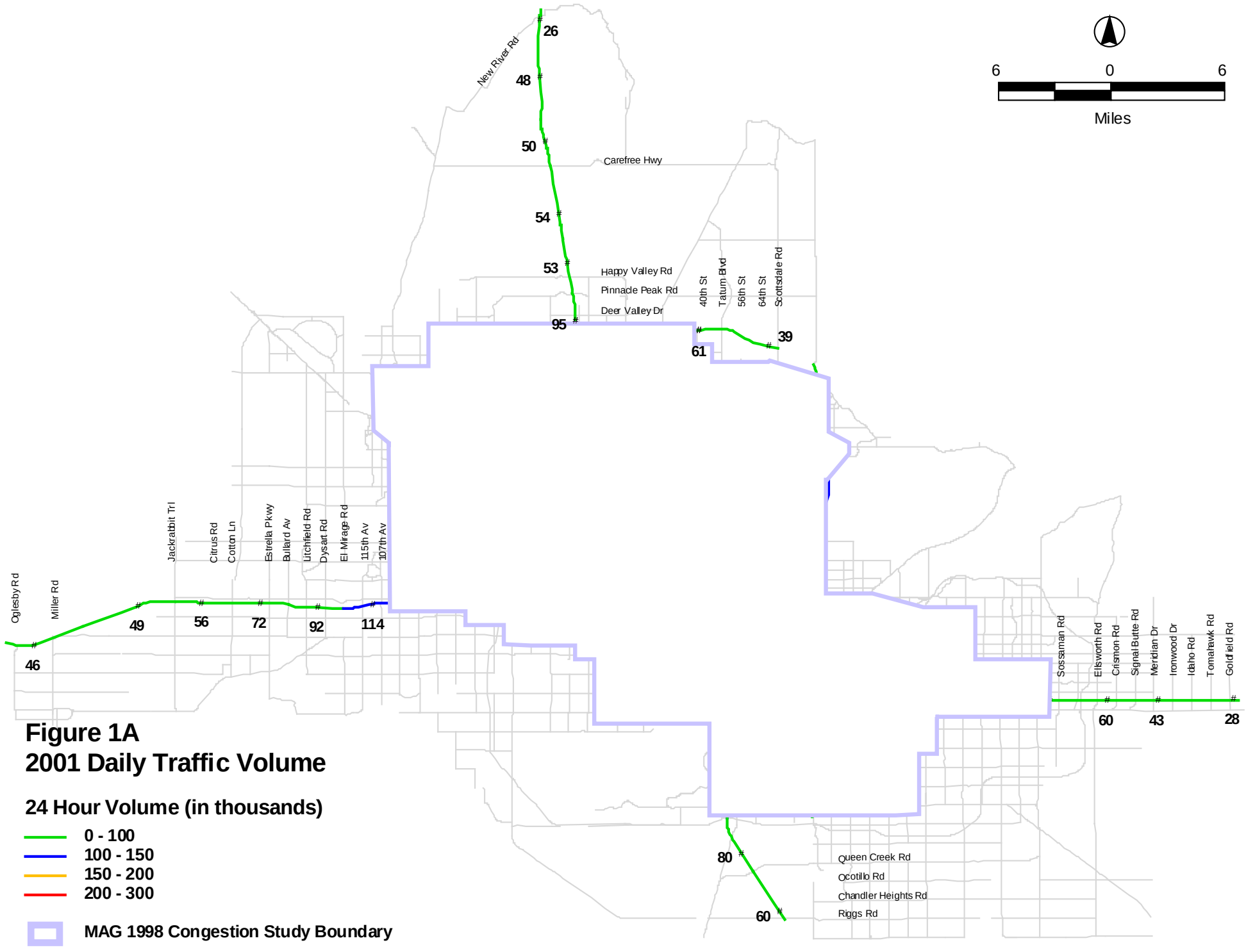
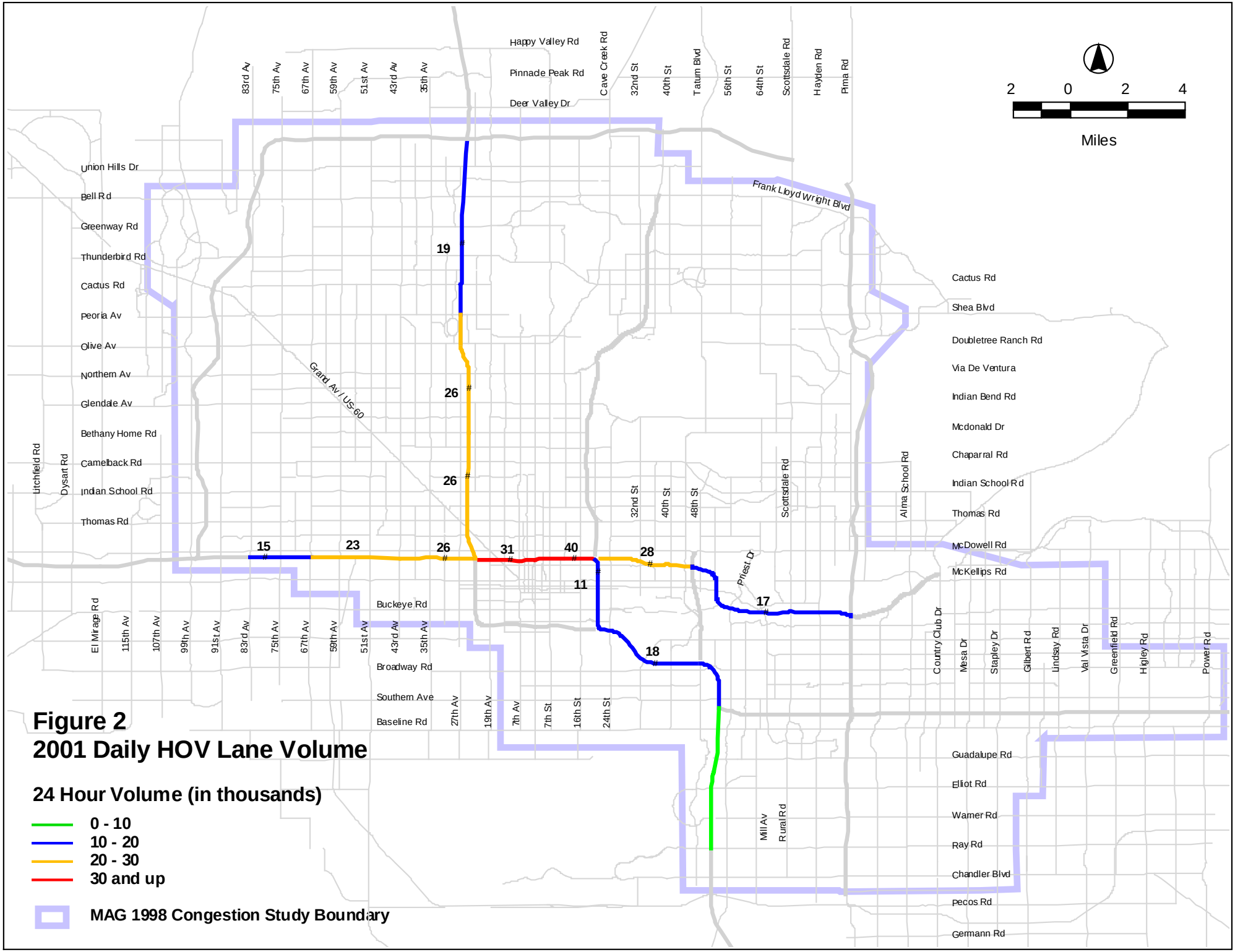


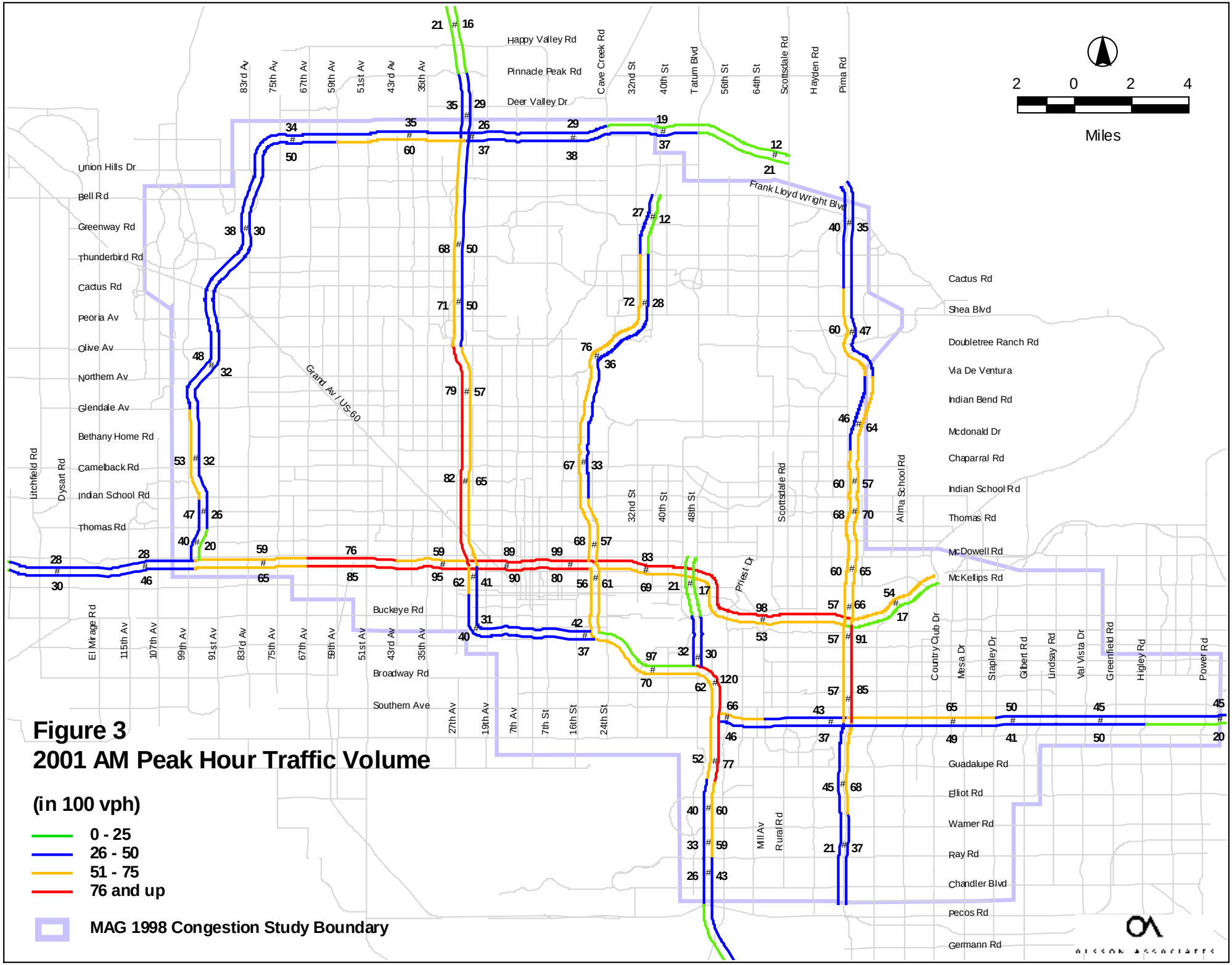
Figure 1A
2001 Daily Traffic Volume

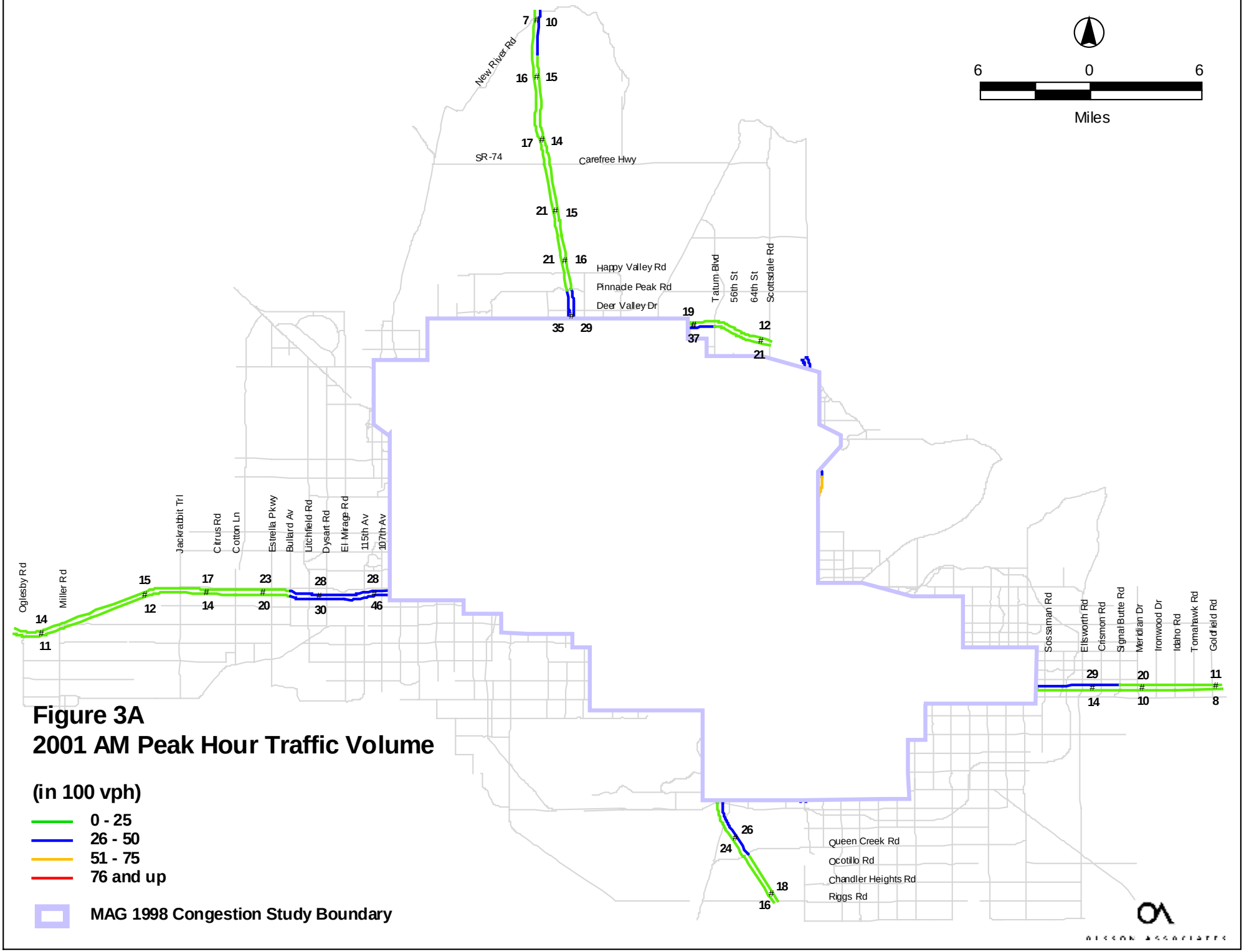
24 Hour Volume (in thousands)

- 0 - 100
- 100 - 150
- 150 - 200
- 200 - 300

MAG 1998 Congestion Study Boundary


Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Dr
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
Cave Creek Rd
32nd St
40th St
Tatum Blvd
56th St
64th St
Scottsdale Rd
Hayden Rd
Pima Rd
2 0 2 4
Miles
Union Hills Dr
Bell Rd
Greenway Rd
Thunderbird Rd
Cactus Rd
Peoria Av
Olive Av
Northern Av
Glendale Av
Bethany Home Rd
Camelback Rd
Indian School Rd
Thomas Rd
Litchfield Rd
Dysart Rd
Grand Av / US-60
Frank Lloyd Wright Blvd
Cactus Rd
Shea Blvd
Doubletree Ranch Rd
Via De Ventura
Indian Bend Rd
Mcdonald Dr
Chaparral Rd
Indian School Rd
Thomas Rd
McDowell Rd
McKellips Rd
Alma School Rd
Scottsdale Rd
32nd St
40th St
48th St
Priest Dr
19
26
26
15
23
26
31
40
28
11
17
18
El Mirage Rd
115th Av
107th Av
99th Av
91st Av
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
Buckeye Rd
Broadway Rd
Southern Ave
Baseline Rd
27th Av
19th Av
7th Av
7th St
16th St
24th St
Country Club Dr
Mesa Dr
Stapley Dr
Gilbert Rd
Lindsay Rd
Val Vista Dr
Greenfield Rd
Higley Rd
Power Rd
Guadalupe Rd
Elliot Rd
Warner Rd
Ray Rd
Chandler Blvd
Pecos Rd
Germann Rd
Mill Av
Rural Rd
Figure 2
2001 Daily HOV Lane Volume
24 Hour Volume (in thousands)
0 - 10
10 - 20
20 - 30
30 and up
MAG 1998 Congestion Study Boundary


Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Dr
Union Hills Dr
Bell Rd
Greenway Rd
Thunderbird Rd
Cactus Rd
Peoria Av
Olive Av
Northern Av
Glendale Av
Bethany Home Rd
Camelback Rd
Indian School Rd
Thomas Rd
Buckeye Rd
Broadway Rd
Southern Ave
Grand Av / US-60
Frank Lloyd Wright Blvd
Priest Dr
Cactus Rd
Shea Blvd
Doubletree Ranch Rd
Via De Ventura
Indian Bend Rd
Mcdonald Dr
Chaparral Rd
Indian School Rd
Thomas Rd
McDowell Rd
McKellips Rd
Guadalupe Rd
Elliot Rd
Warner Rd
Ray Rd
Chandler Blvd
Pecos Rd
Germann Rd
Litchfield Rd
Dysart Rd
El Mirage Rd
115th Av
107th Av
99th Av
91st Av
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
27th Av
19th Av
7th Av
7th St
16th St
24th St
32nd St
40th St
48th St
56th St
64th St
Scottsdale Rd
Hayden Rd
Tatum Blvd
Cave Creek Rd
Pima Rd
Alma School Rd
Mill Av
Rural Rd
Country Club Dr
Mesa Dr
Stapley Dr
Gilbert Rd
Lindsay Rd
Val Vista Dr
Greenfield Rd
Higley Rd
Power Rd
2 0 2 4
Miles
Figure 3
2001 AM Peak Hour Traffic Volume
(in 100 vph)
0 - 25
26 - 50
51 - 75
76 and up
MAG 1998 Congestion Study Boundary


6 0 6
Miles
New River Rd
SR-74
Carefree Hwy
Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Dr
Tatum Blvd
56th St
64th St
Scottsdale Rd
Ogilesby Rd
Miller Rd
Jackrabbit Trl
Citrus Rd
Cotton Ln
Estrella Pkwy
Bullard Av
Litchfield Rd
Dysart Rd
El Mirage Rd
115th Av
107th Av
Sossaman Rd
Ellsworth Rd
Crismon Rd
Signal Butte Rd
Meridian Dr
Ironwood Dr
Idaho Rd
Tomahawk Rd
Goldfield Rd
Queen Creek Rd
Ocotillo Rd
Chandler Heights Rd
Riggs Rd
Figure 3A
2001 AM Peak Hour Traffic Volume
(in 100 vph)
0 - 25
26 - 50
51 - 75
76 and up
MAG 1998 Congestion Study Boundary

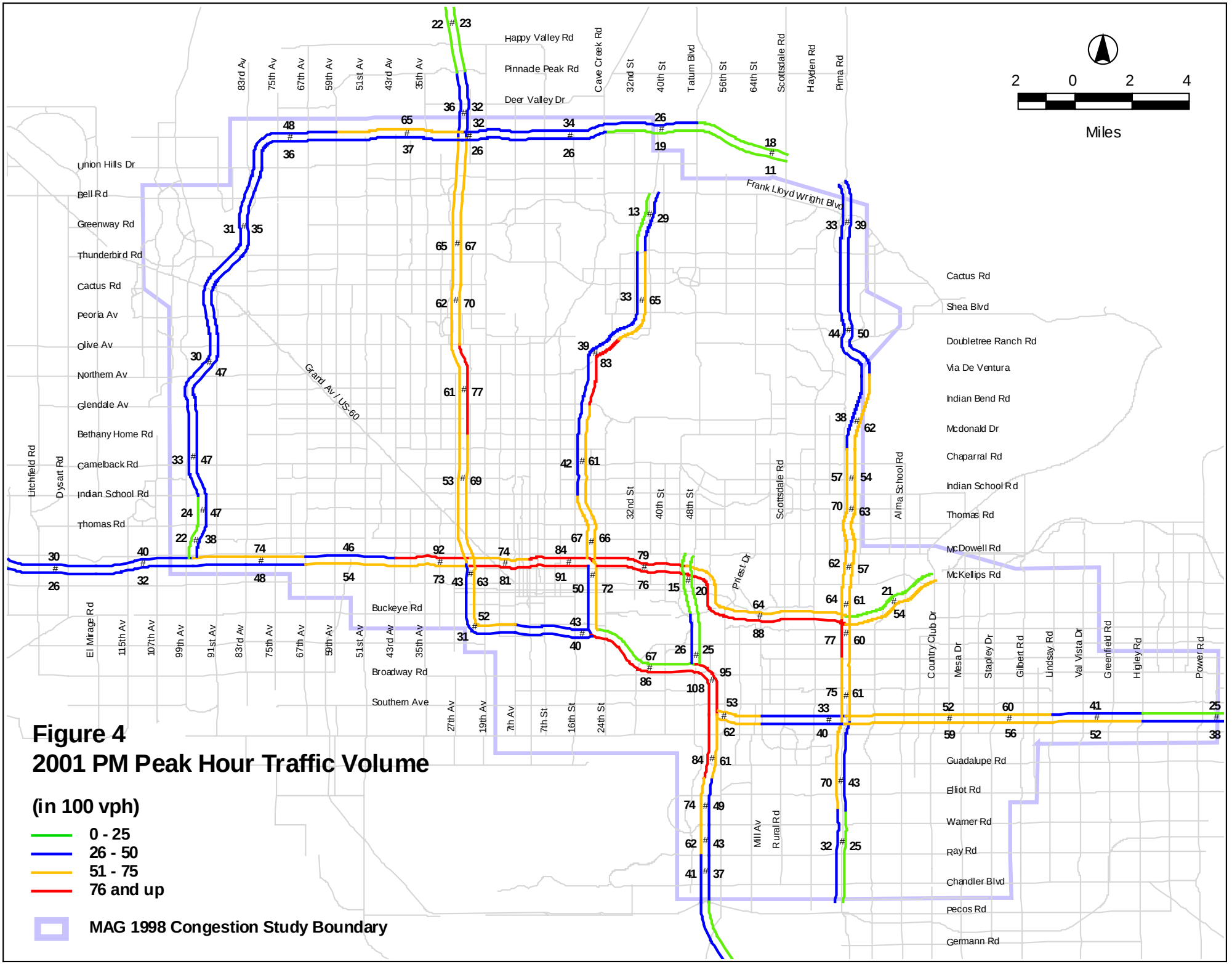


Figure 4
2001 PM Peak Hour Traffic Volume

(in 100 vph)

- 0 - 25
- 26 - 50
- 51 - 75
- 76 and up

MAG 1998 Congestion Study Boundary

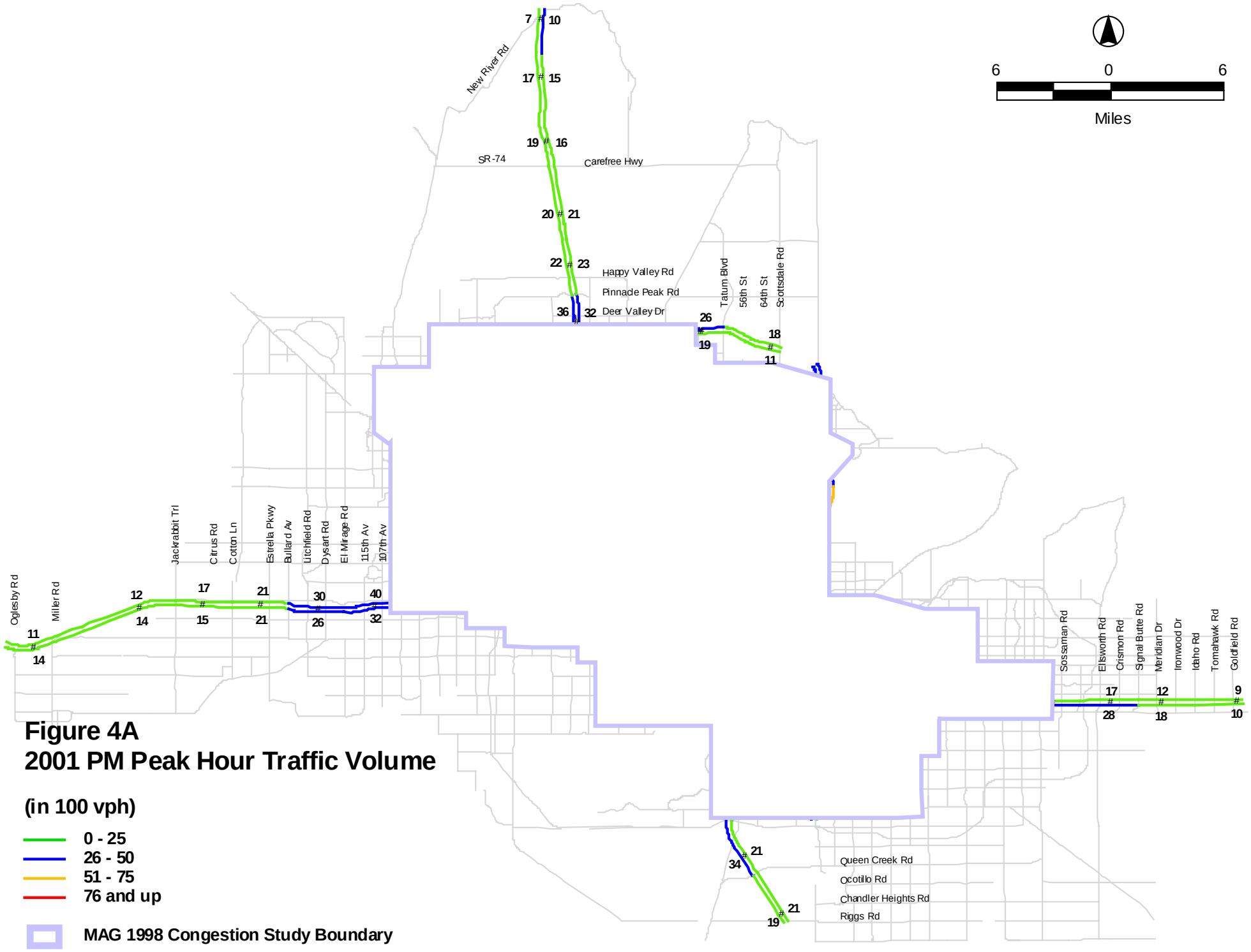


Figure 4A
2001 PM Peak Hour Traffic Volume

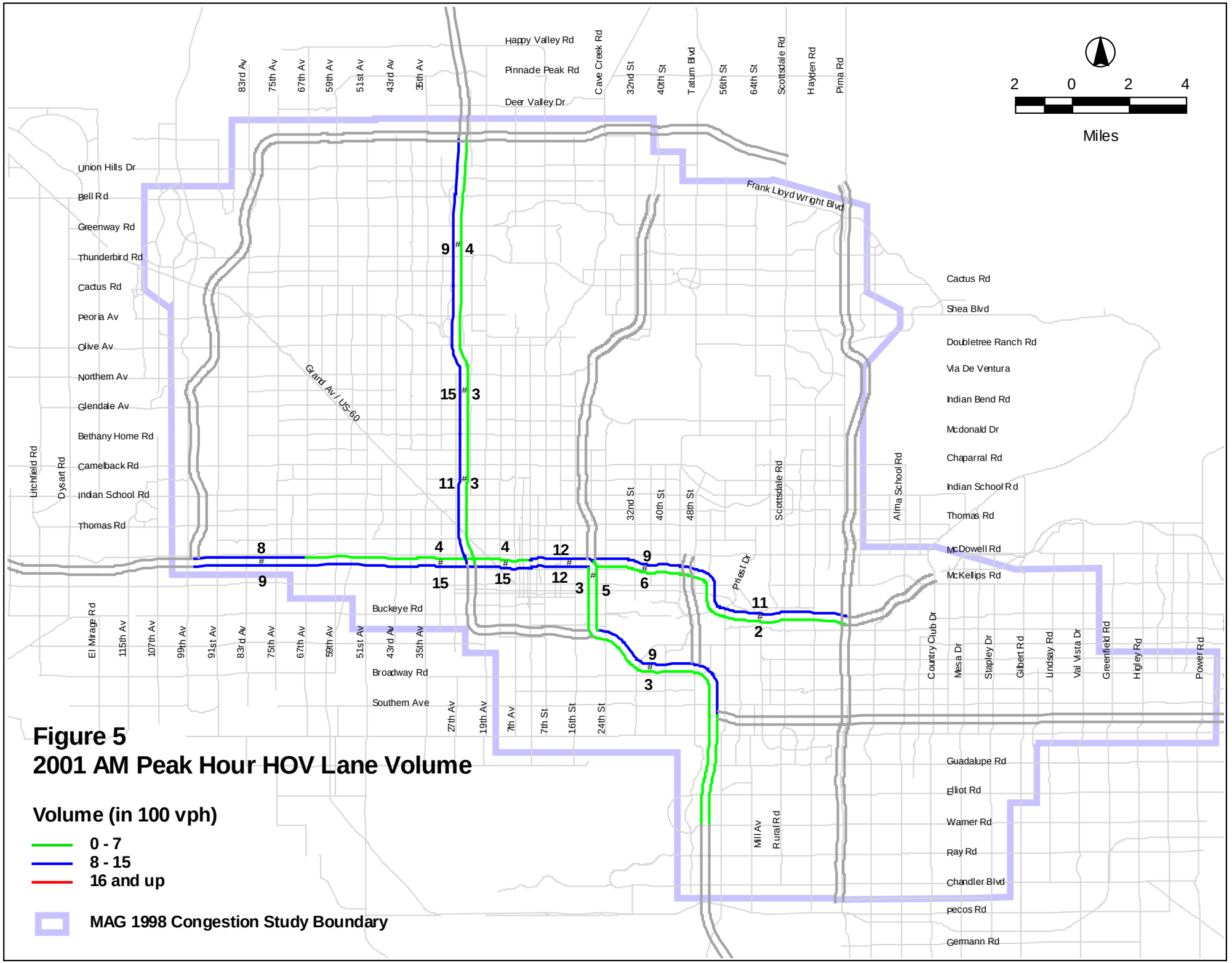


Figure 5
2001 AM Peak Hour HOV Lane Volume

Volume (in 100 vph)

- 0 - 7
- 8 - 15
- 16 and up

MAG 1998 Congestion Study Boundary

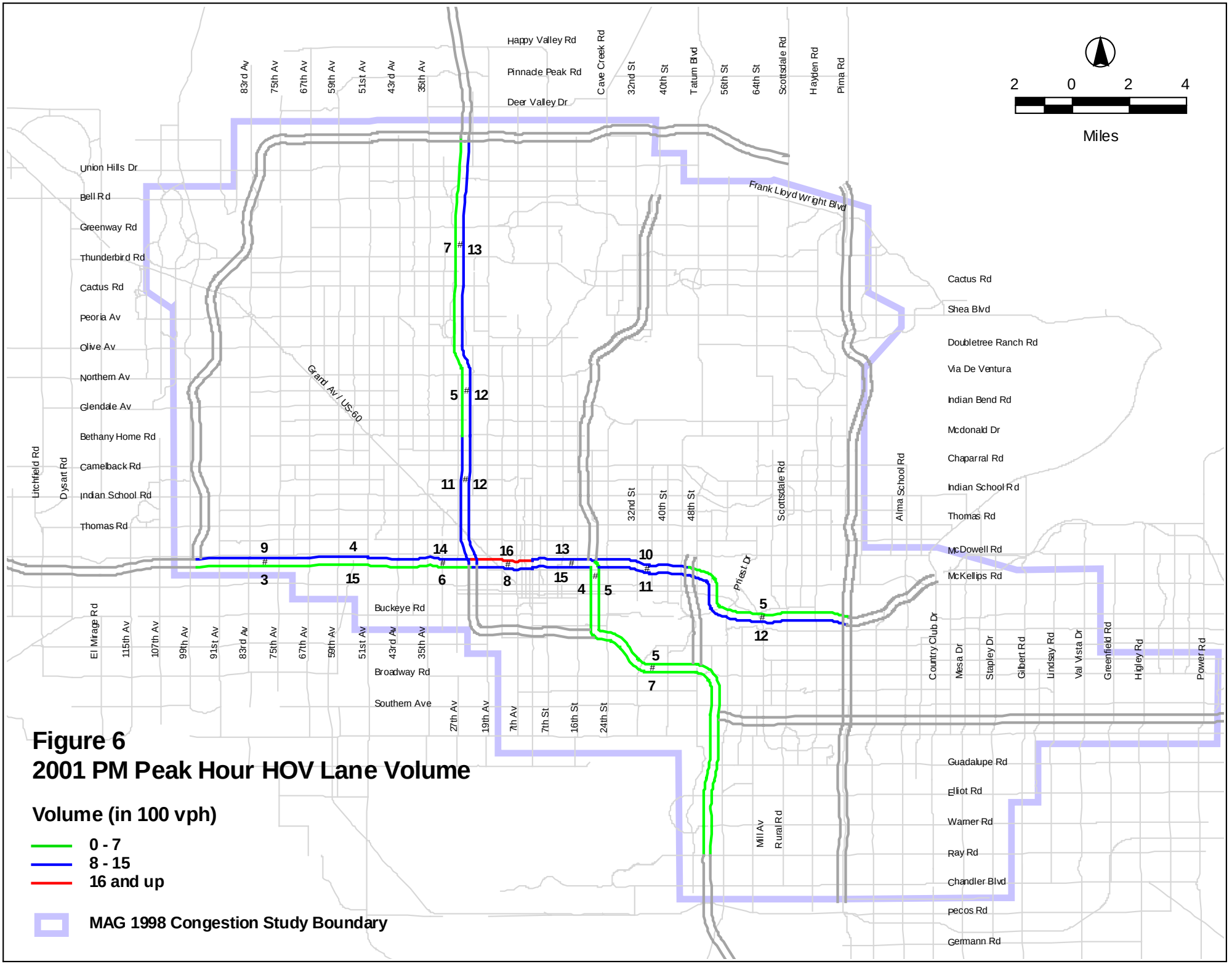


Figure 6
2001 PM Peak Hour HOV Lane Volume

Volume (in 100 vph)

- 0 - 7
- 8 - 15
- 16 and up

MAG 1998 Congestion Study Boundary

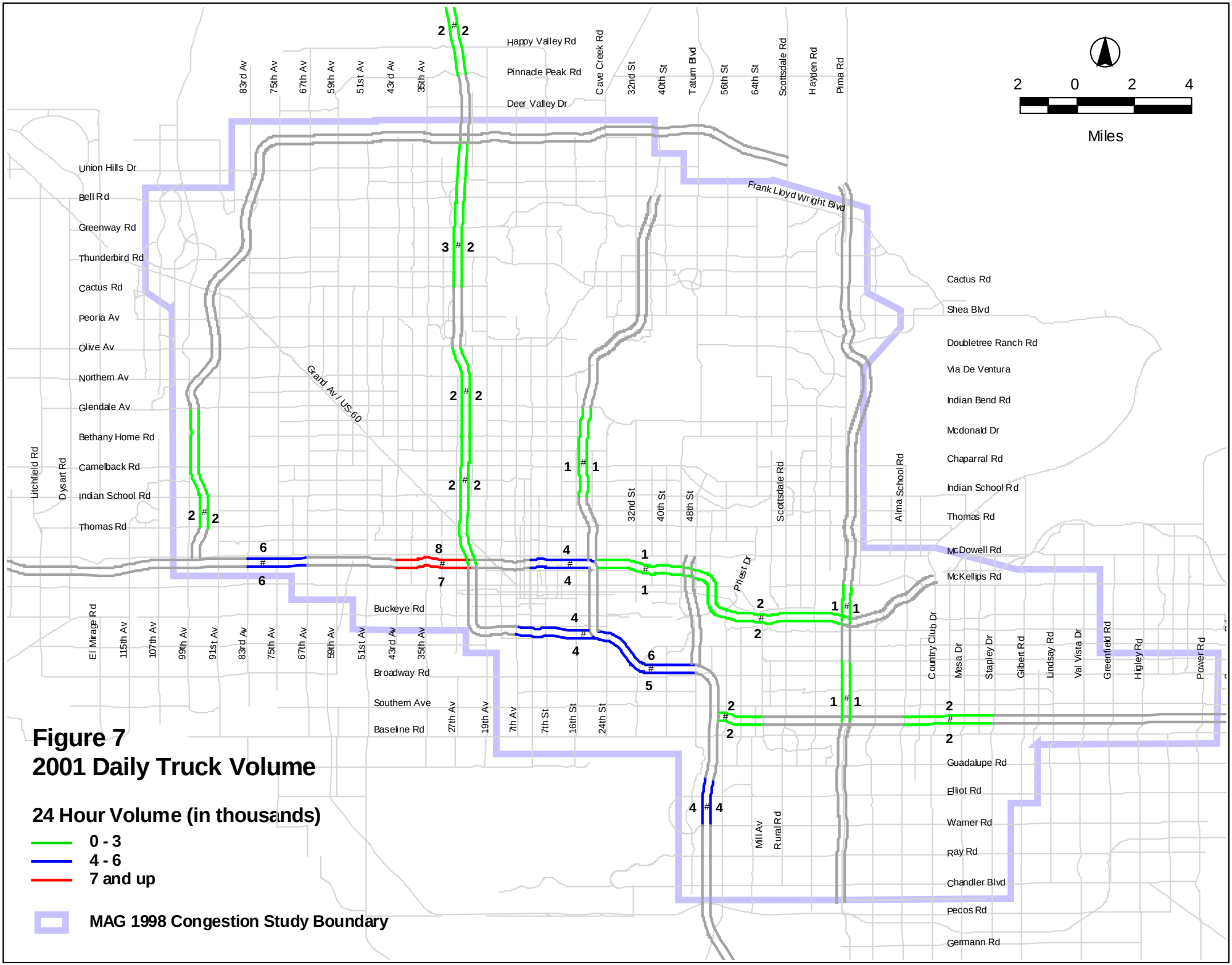


Figure 7
2001 Daily Truck Volume

24 Hour Volume (in thousands)

- 0 - 3
- 4 - 6
- 7 and up

MAG 1998 Congestion Study Boundary

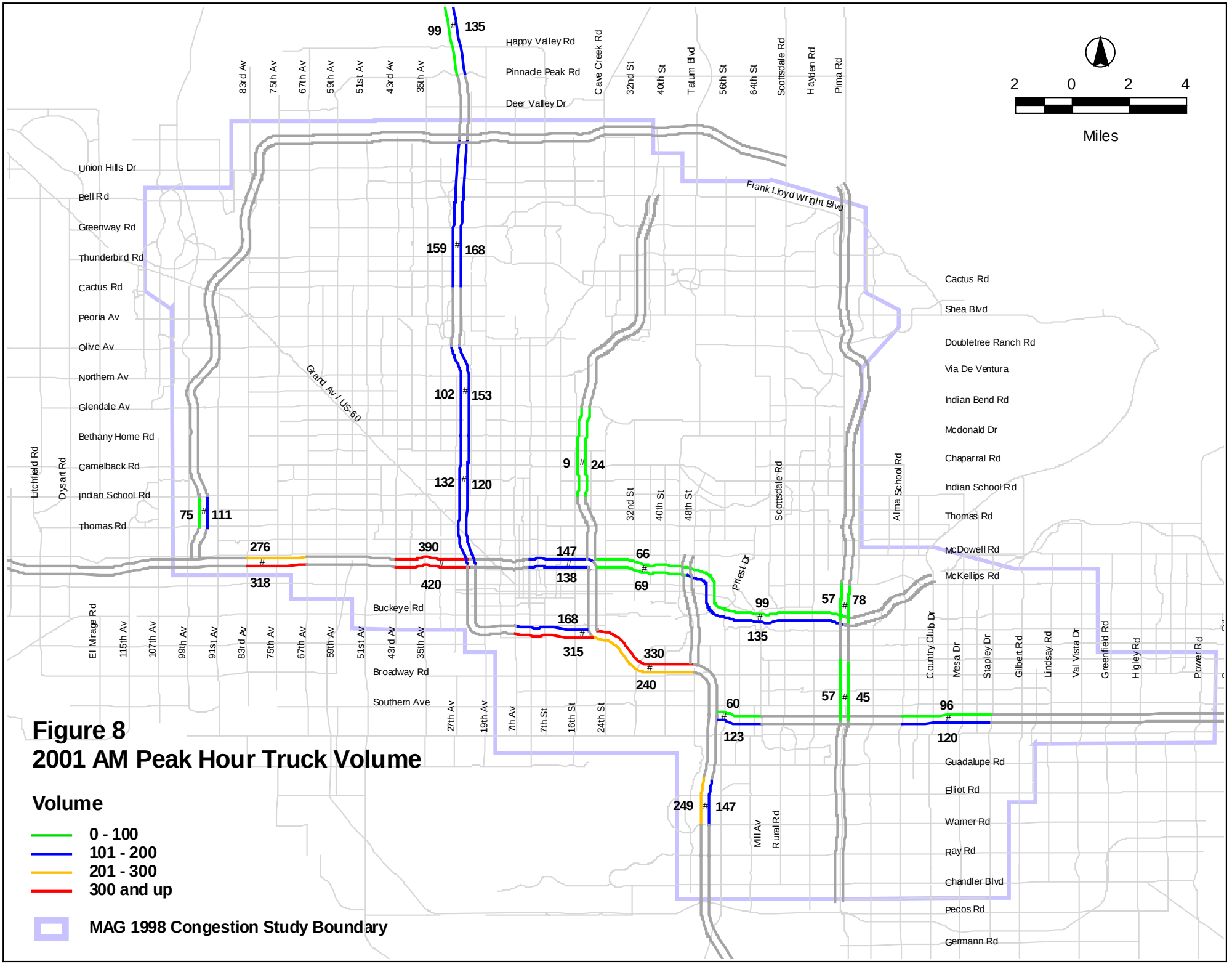
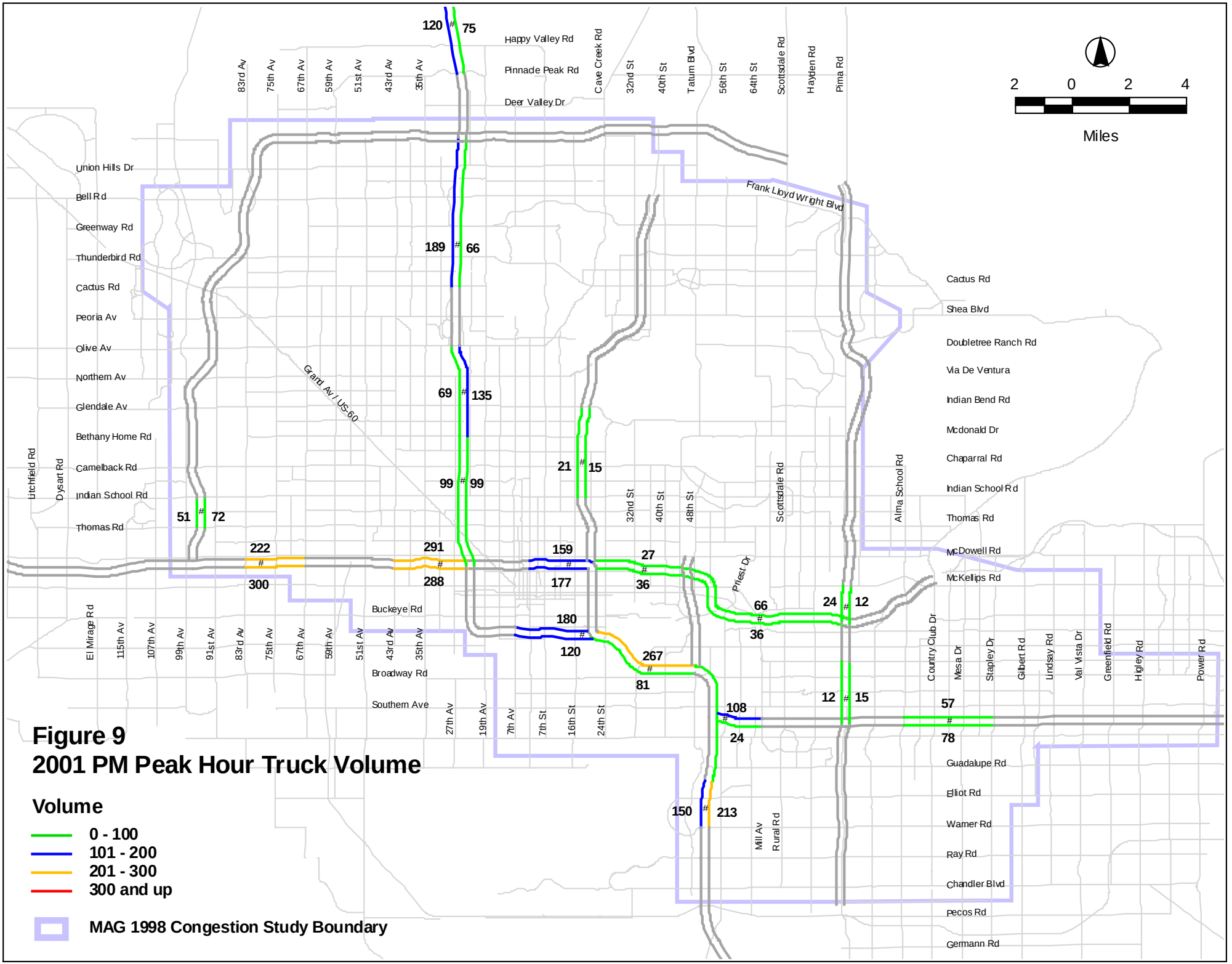


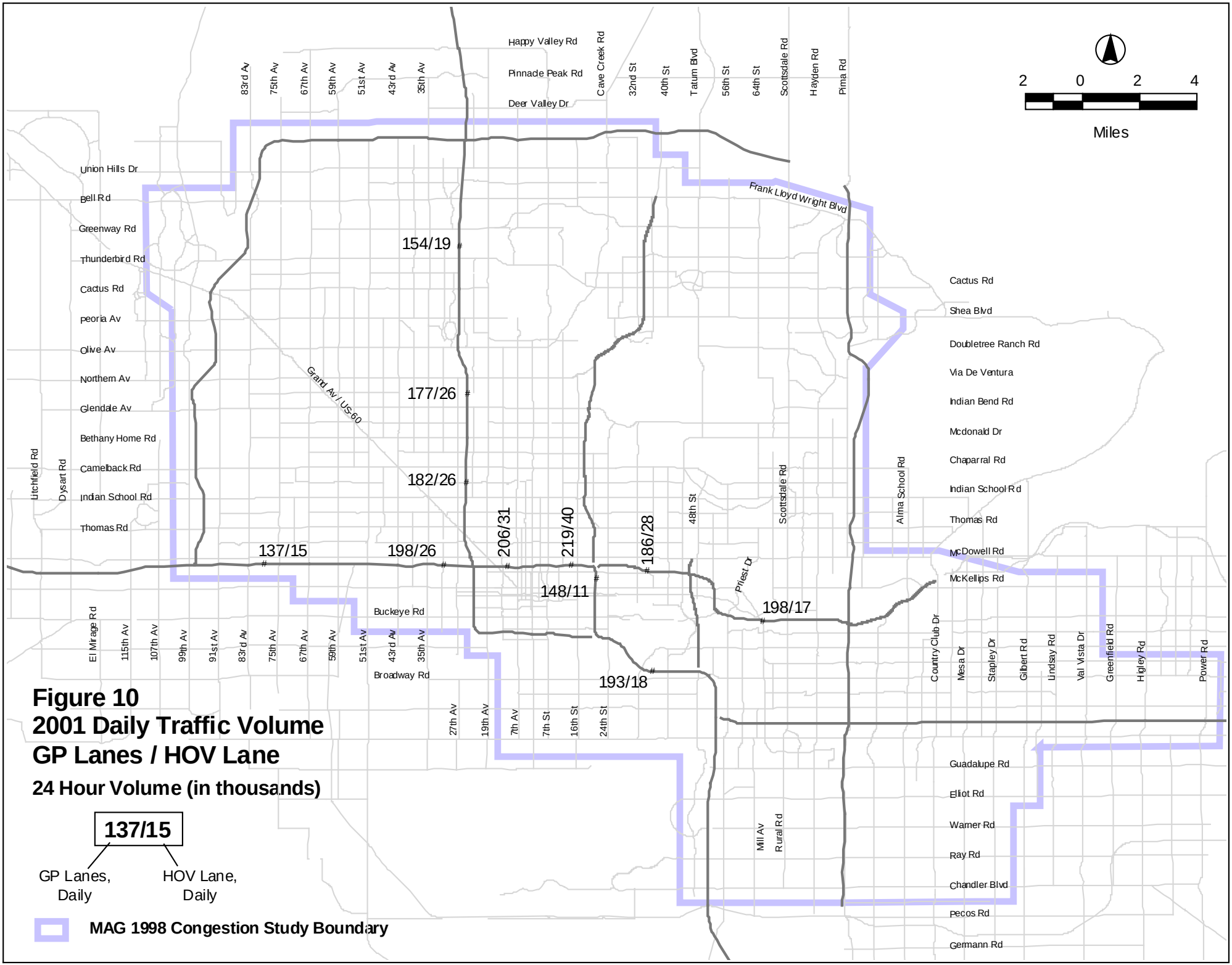
Figure 8
2001 AM Peak Hour Truck Volume

Volume

- 0 - 100
- 101 - 200
- 201 - 300
- 300 and up

MAG 1998 Congestion Study Boundary


Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Dr
Union Hills Dr
Bell Rd
Greenway Rd
Thunderbird Rd
Cactus Rd
Peoria Av
Olive Av
Northern Av
Glendale Av
Bethany Home Rd
Camelback Rd
Indian School Rd
Thomas Rd
Grand Av / US-60
Frank Lloyd Wright Blvd
Cactus Rd
Shea Blvd
Doubletree Ranch Rd
Via De Ventura
Indian Bend Rd
Mcdonald Dr
Chaparral Rd
Indian School Rd
Thomas Rd
McDowell Rd
McKellips Rd
Priest Dr
Buckeye Rd
Broadway Rd
Southern Ave
Guadalupe Rd
Elliot Rd
Warner Rd
Ray Rd
Chandler Blvd
Pecos Rd
Germann Rd
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
Cave Creek Rd
32nd St
40th St
Tatum Blvd
56th St
64th St
Scottsdale Rd
Hayden Rd
Pima Rd
48th St
Alma School Rd
Litchfield Rd
Dysart Rd
El Mirage Rd
115th Av
107th Av
99th Av
91st Av
27th Av
19th Av
7th Av
7th St
16th St
24th St
Mill Av
Rural Rd
Country Club Dr
Mesa Dr
Stapley Dr
Gilbert Rd
Lindsay Rd
Val Vista Dr
Greenfield Rd
Higley Rd
Power Rd
2 0 2 4
Miles
120 # 75
189 # 66
69 # 135
99 # 99
51 # 72
21 # 15
222 # 300
291 # 288
159 # 177
27 # 36
66 # 36
24 # 12
180 # 120
267 # 81
108 # 24
12 # 15
57 # 78
150 # 213
Figure 9
2001 PM Peak Hour Truck Volume
Volume
0 - 100
101 - 200
201 - 300
300 and up
MAG 1998 Congestion Study Boundary


Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Dr
Cave Creek Rd
32nd St
40th St
Tatum Blvd
56th St
64th St
Scottsdale Rd
Hayden Rd
Pima Rd
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
2 0 2 4
Miles
Union Hills Dr
Bell Rd
Greenway Rd
Thunderbird Rd
Cactus Rd
Peoria Av
Olive Av
Northern Av
Glendale Av
Bethany Home Rd
Camelback Rd
Indian School Rd
Thomas Rd
Frank Lloyd Wright Blvd
154/19
177/26
182/26
Grand Av / US-60
Litchfield Rd
Dysart Rd
137/15
198/26
206/31
219/40
186/28
148/11
198/17
48th St
Scottsdale Rd
Alma School Rd
Priest Dr
Cactus Rd
Shea Blvd
Doubletree Ranch Rd
Via De Ventura
Indian Bend Rd
Mcdonald Dr
Chaparral Rd
Indian School Rd
Thomas Rd
McDowell Rd
McKellips Rd
El Mirage Rd
115th Av
107th Av
99th Av
91st Av
83rd Av
75th Av
67th Av
59th Av
51st Av
43rd Av
35th Av
Buckeye Rd
Broadway Rd
193/18
27th Av
19th Av
7th Av
7th St
16th St
24th St
Country Club Dr
Mesa Dr
Stapley Dr
Gilbert Rd
Lindsay Rd
Val Vista Dr
Greenfield Rd
Higley Rd
Power Rd
Guadalupe Rd
Elliot Rd
Warner Rd
Ray Rd
Chandler Blvd
Pecos Rd
Germann Rd
Mill Av
Rural Rd
Figure 10
2001 Daily Traffic Volume
GP Lanes / HOV Lane
24 Hour Volume (in thousands)
137/15
GP Lanes, Daily
HOV Lane, Daily
MAG 1998 Congestion Study Boundary

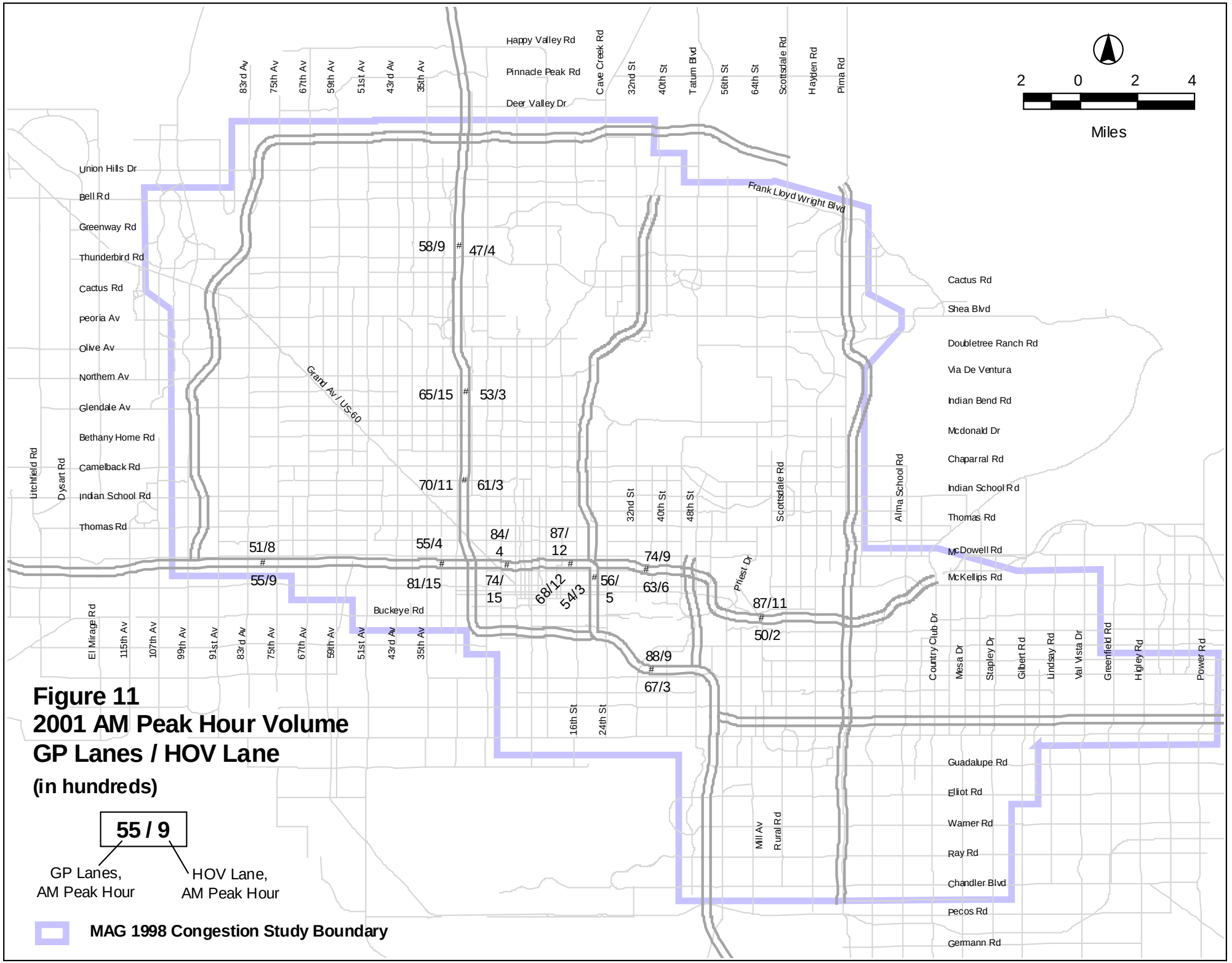


Figure 11
2001 AM Peak Hour Volume
GP Lanes / HOV Lane
(in hundreds)

55 / 9

GP Lanes, AM Peak Hour

HOV Lane, AM Peak Hour

MAG 1998 Congestion Study Boundary

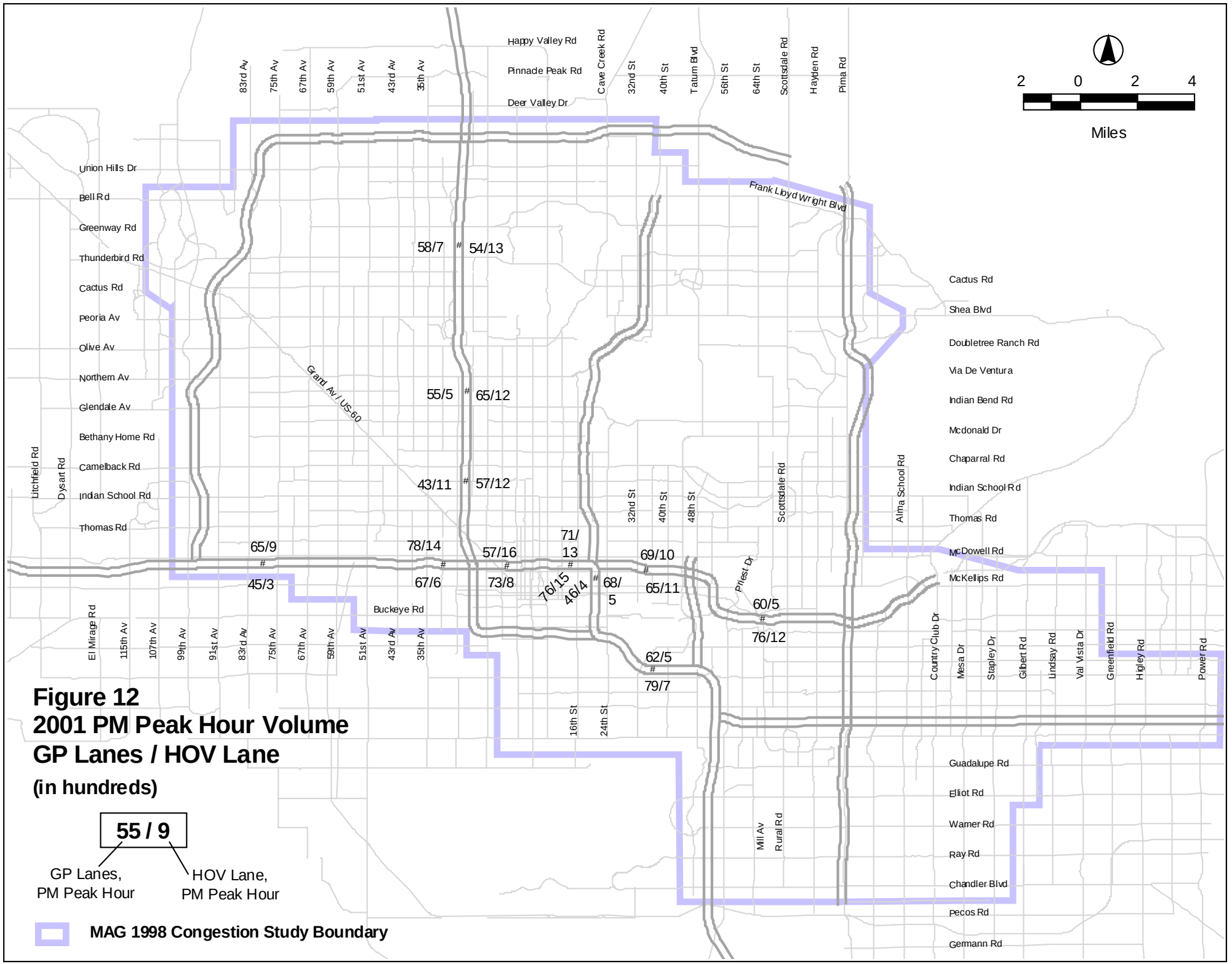


Figure 12
2001 PM Peak Hour Volume
GP Lanes / HOV Lane
(in hundreds)

55 / 9

GP Lanes, PM Peak Hour

HOV Lane, PM Peak Hour

MAG 1998 Congestion Study Boundary

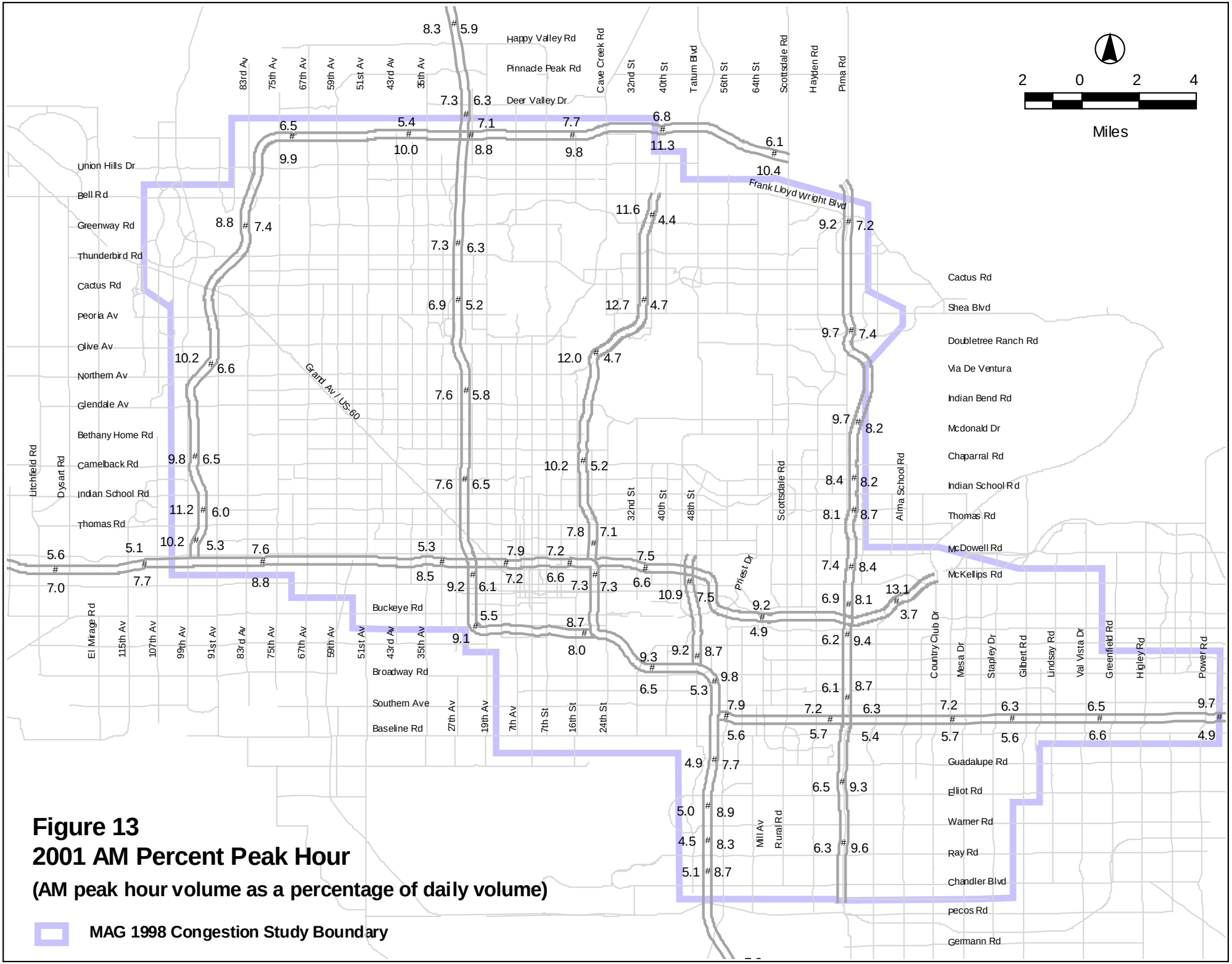


Figure 13
2001 AM Percent Peak Hour
(AM peak hour volume as a percentage of daily volume)

MAG 1998 Congestion Study Boundary

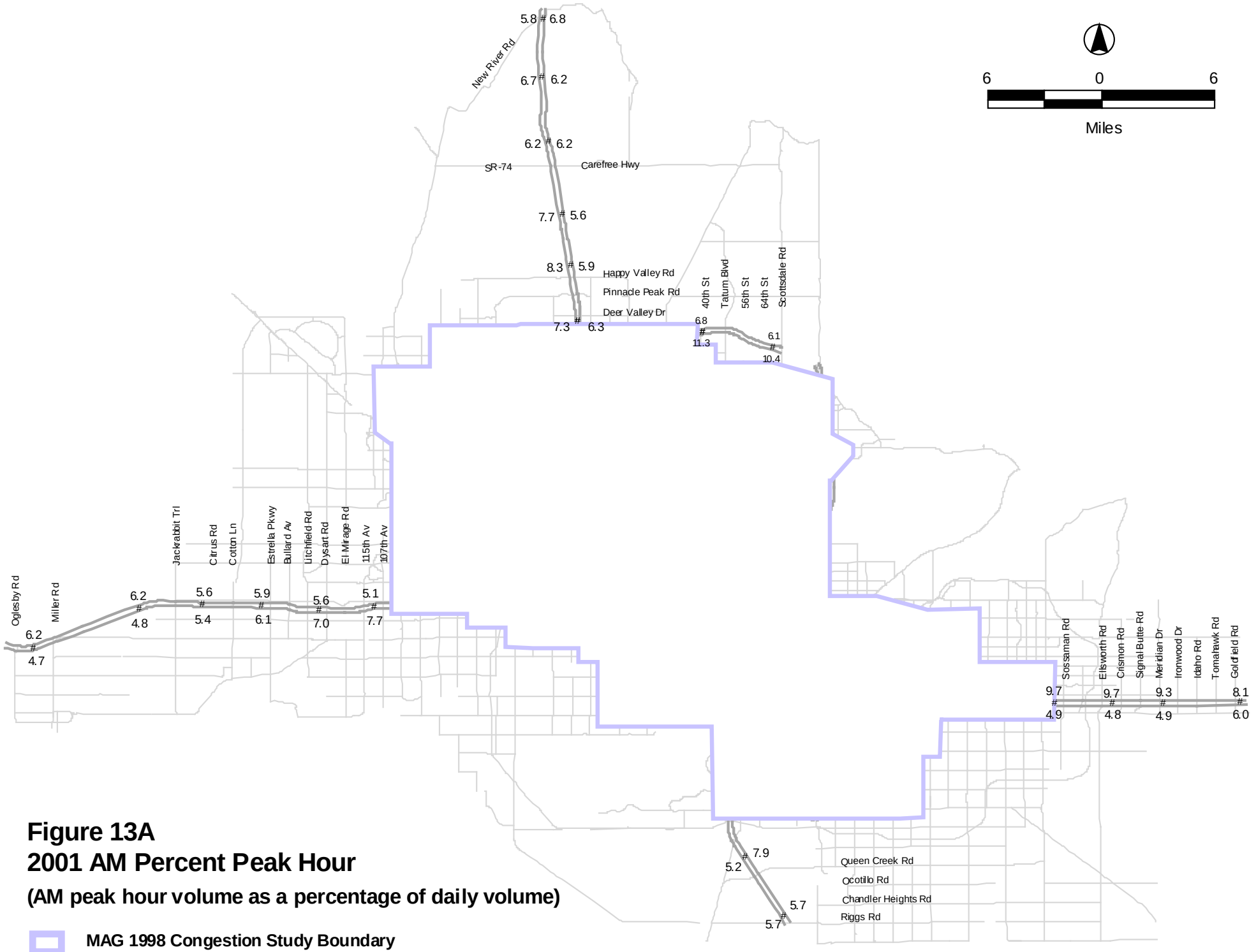


Figure 13A
2001 AM Percent Peak Hour
(AM peak hour volume as a percentage of daily volume)

MAG 1998 Congestion Study Boundary

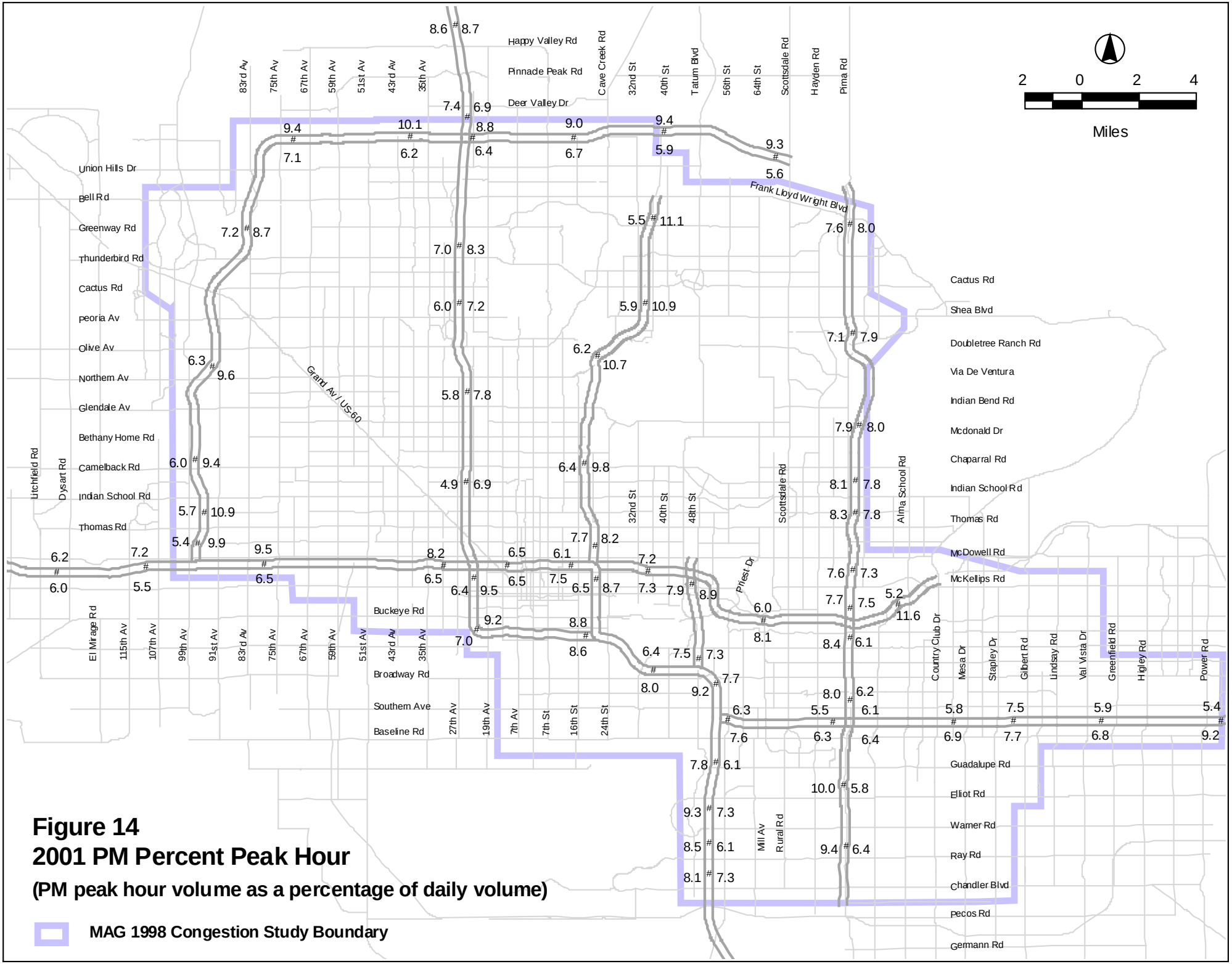


Figure 14
2001 PM Percent Peak Hour
(PM peak hour volume as a percentage of daily volume)

MAG 1998 Congestion Study Boundary

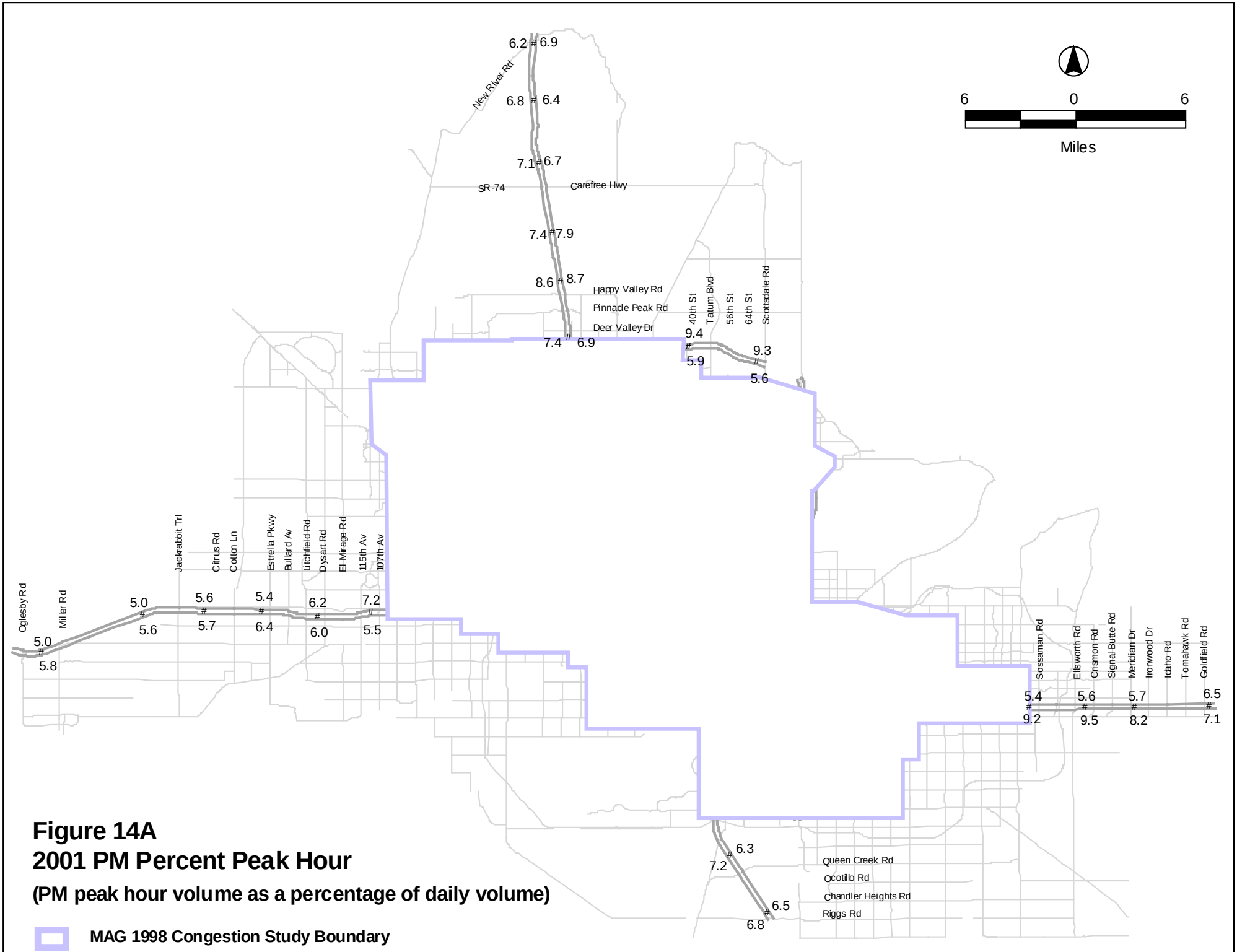


Figure 14A
2001 PM Percent Peak Hour
(PM peak hour volume as a percentage of daily volume)

MAG 1998 Congestion Study Boundary

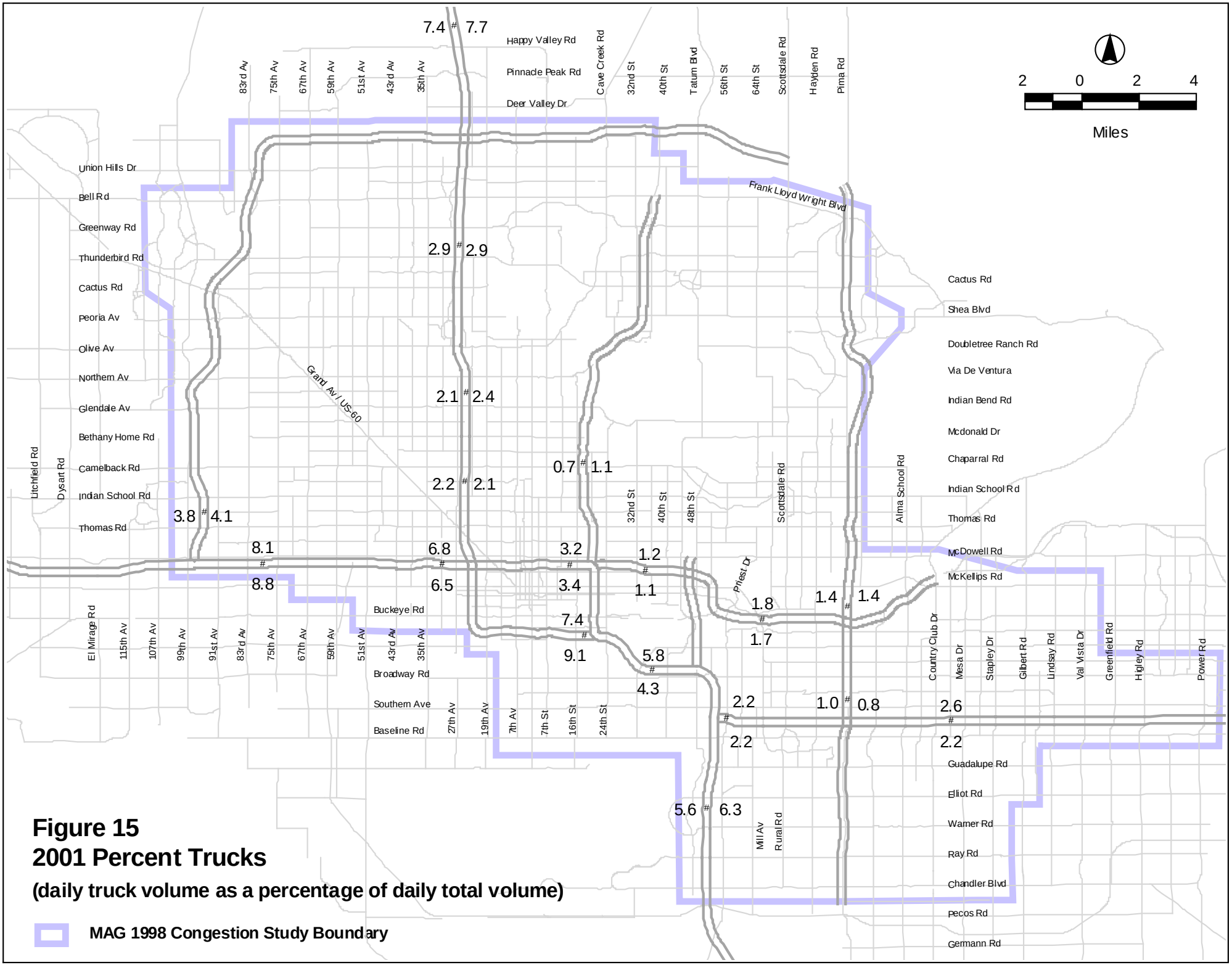


Figure 15
2001 Percent Trucks
(daily truck volume as a percentage of daily total volume)

MAG 1998 Congestion Study Boundary

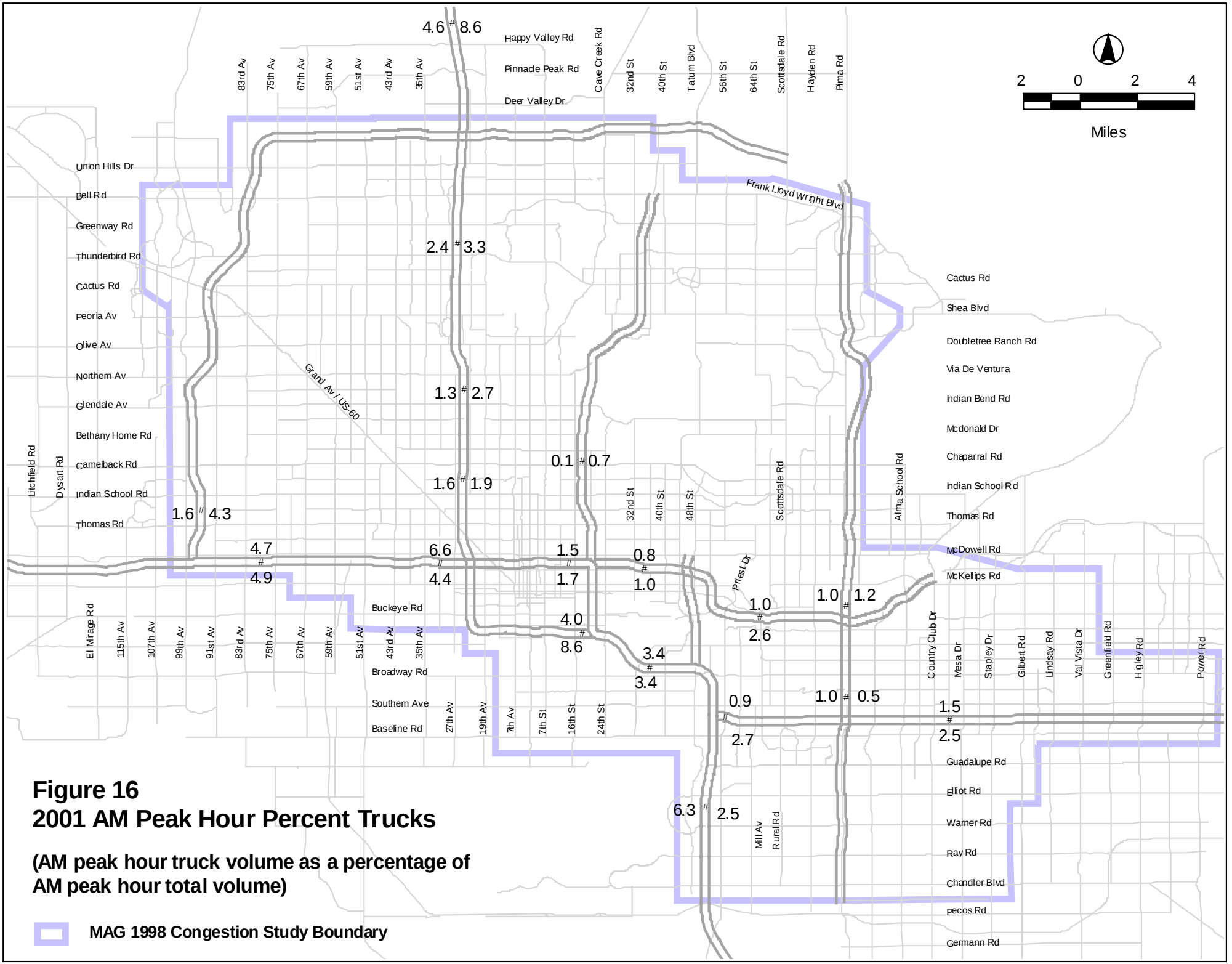


Figure 16
2001 AM Peak Hour Percent Trucks

(AM peak hour truck volume as a percentage of AM peak hour total volume)

MAG 1998 Congestion Study Boundary

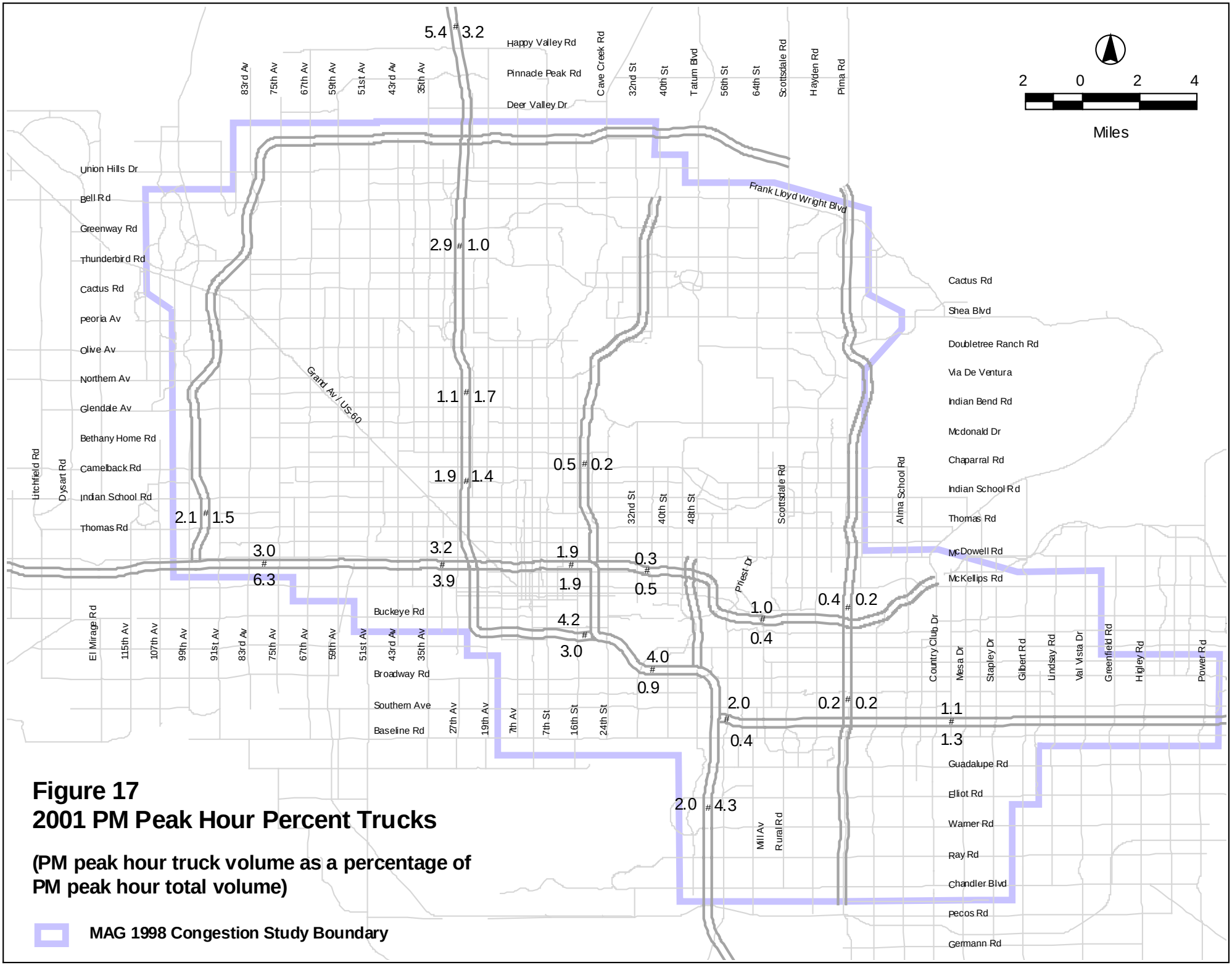


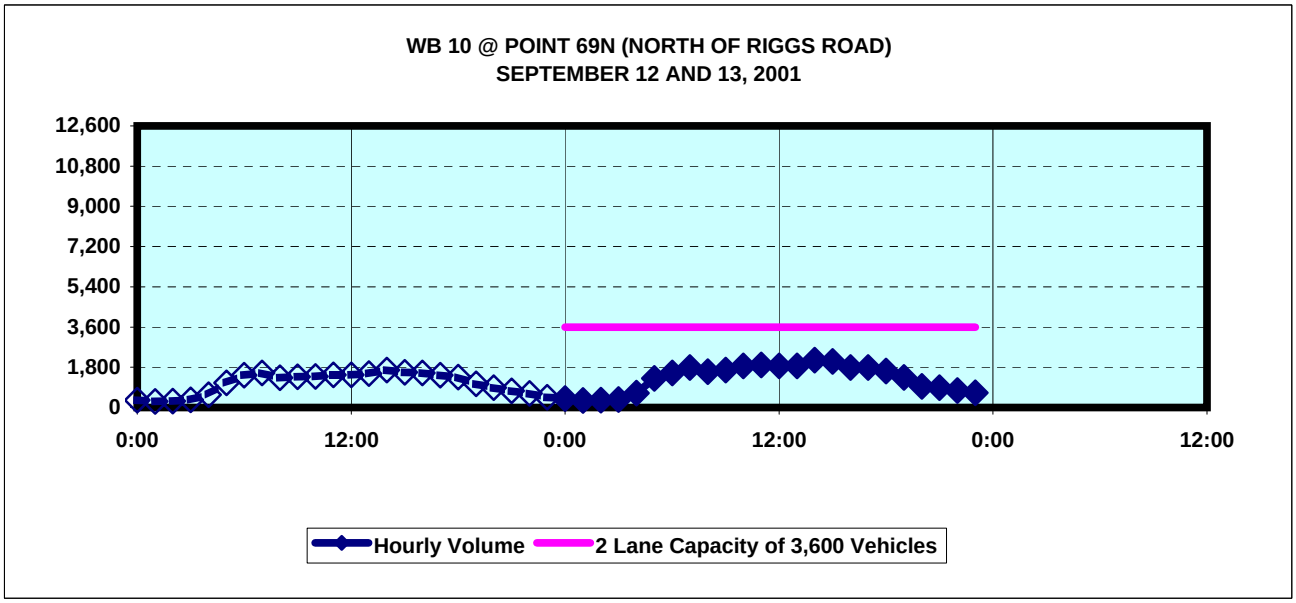
Figure 17
2001 PM Peak Hour Percent Trucks

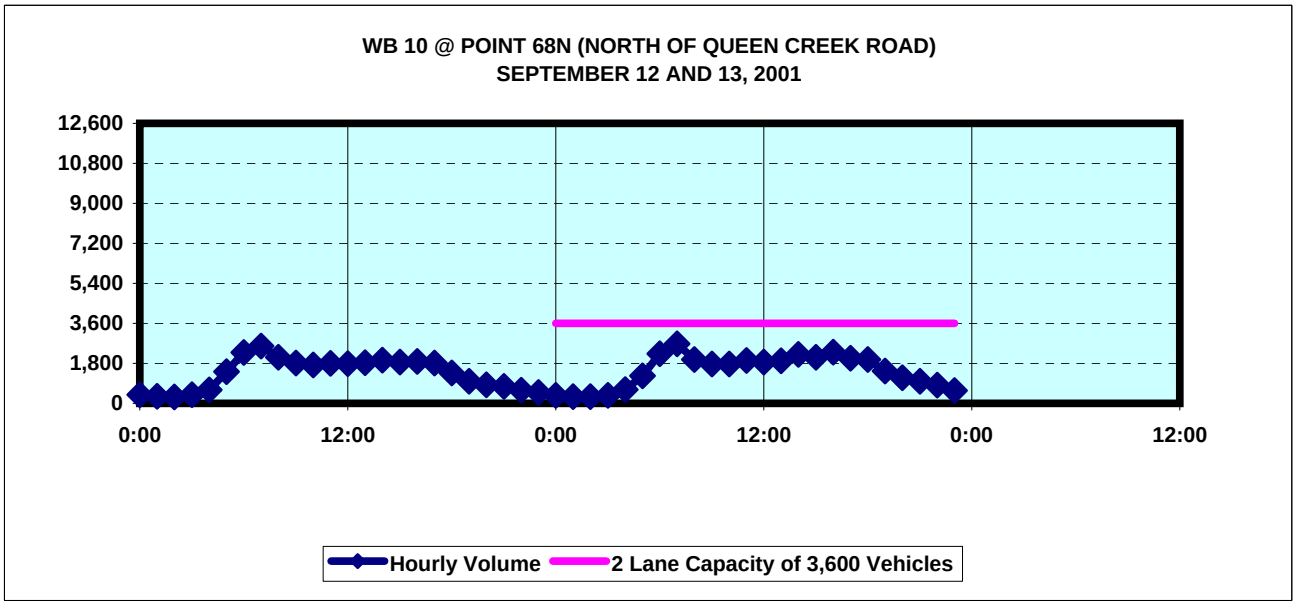
(PM peak hour truck volume as a percentage of PM peak hour total volume)

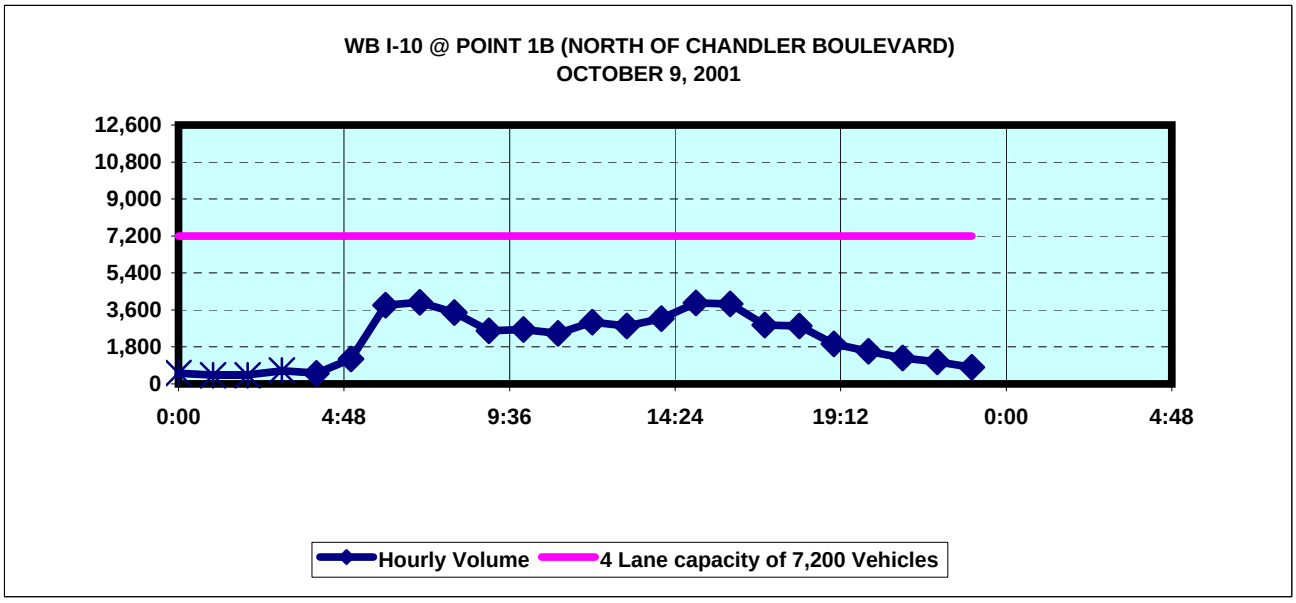
MAG 1998 Congestion Study Boundary

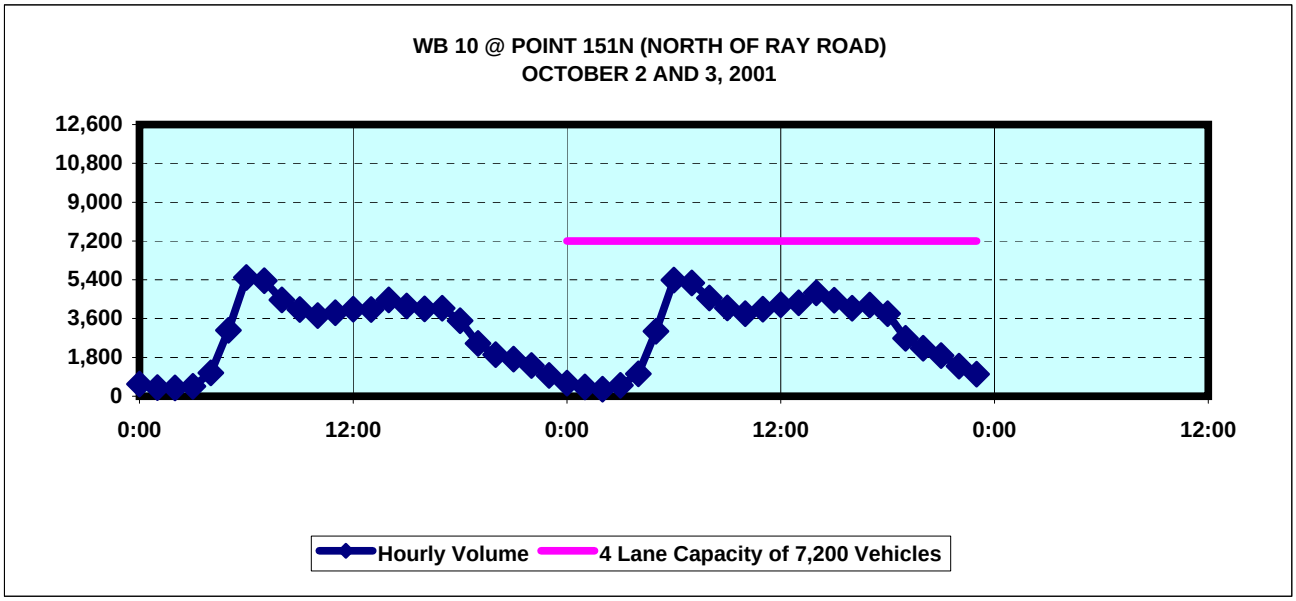
APPENDIX D

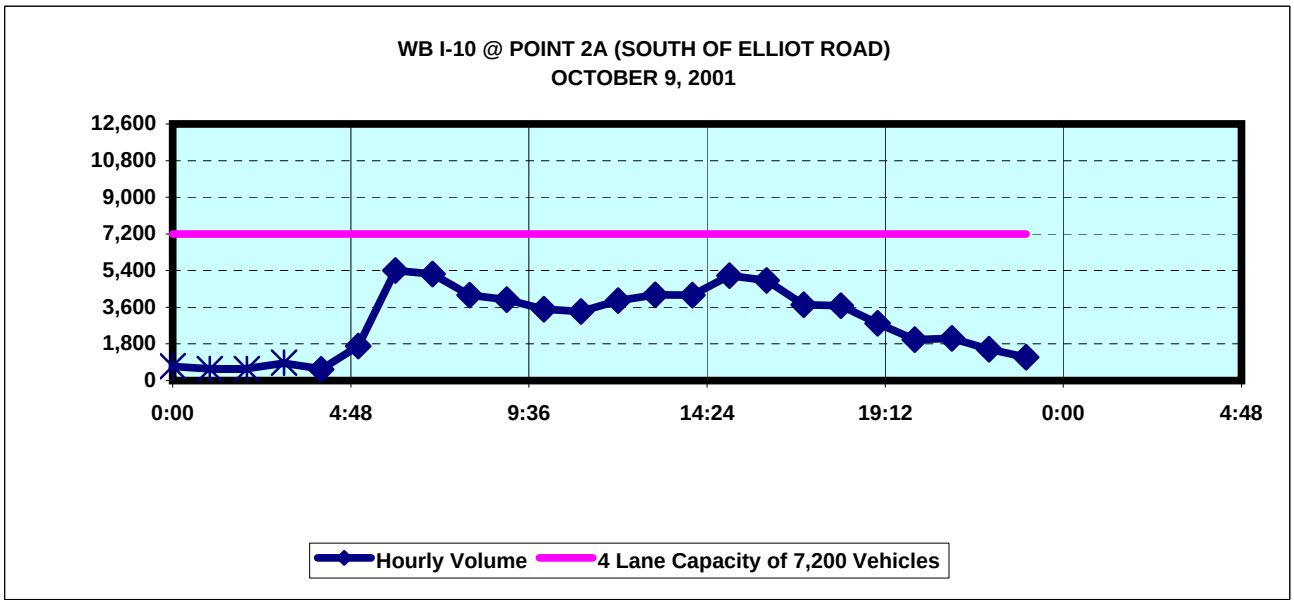
I-10 WESTBOUND
DAILY TRAFFIC VOLUMES

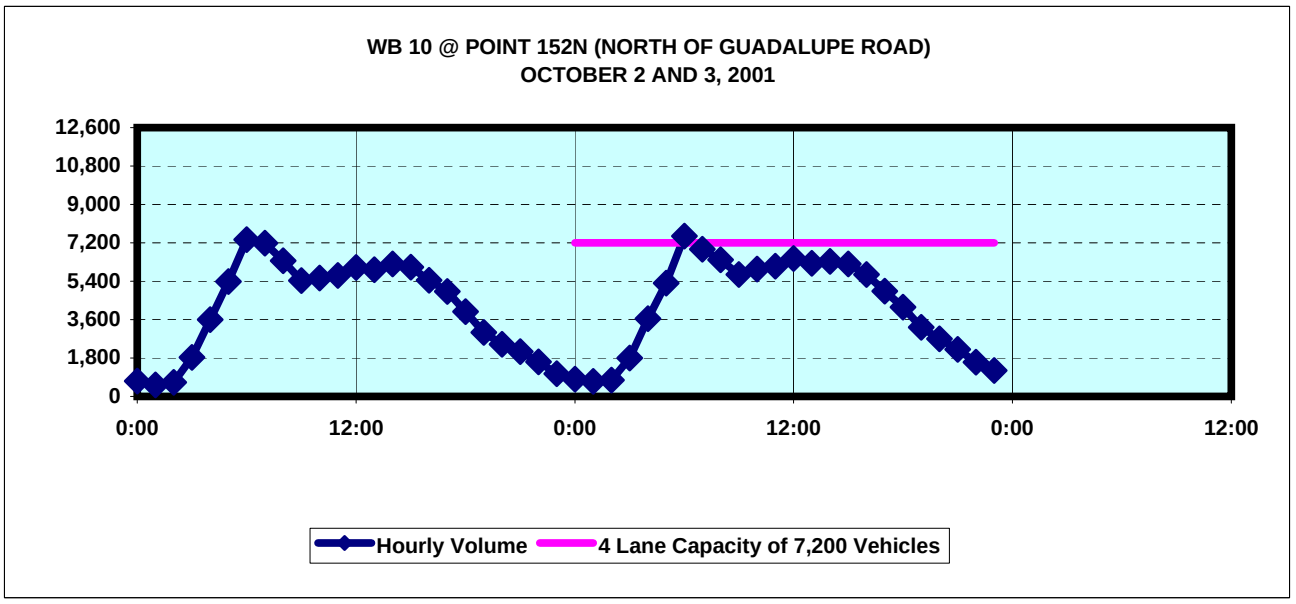

WB 10 @ POINT 69N (NORTH OF RIGGS ROAD)
SEPTEMBER 12 AND 13, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

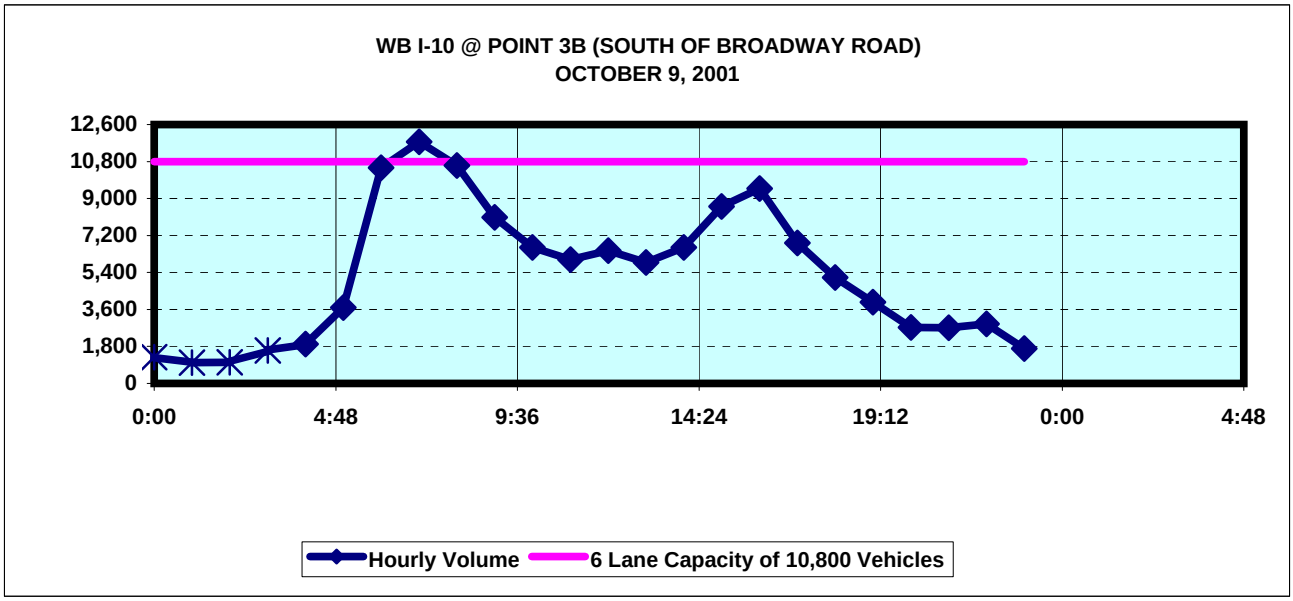

WB 10 @ POINT 68N (NORTH OF QUEEN CREEK ROAD)
SEPTEMBER 12 AND 13, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

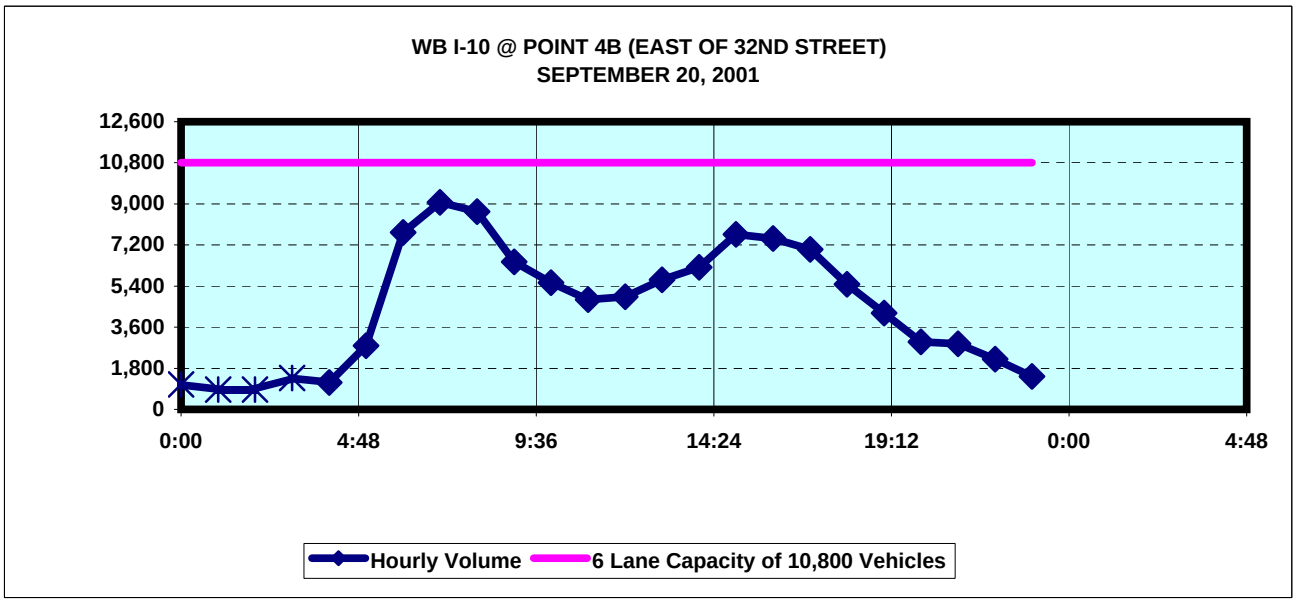

WB I-10 @ POINT 1B (NORTH OF CHANDLER BOULEVARD)
OCTOBER 9, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
4 Lane capacity of 7,200 Vehicles

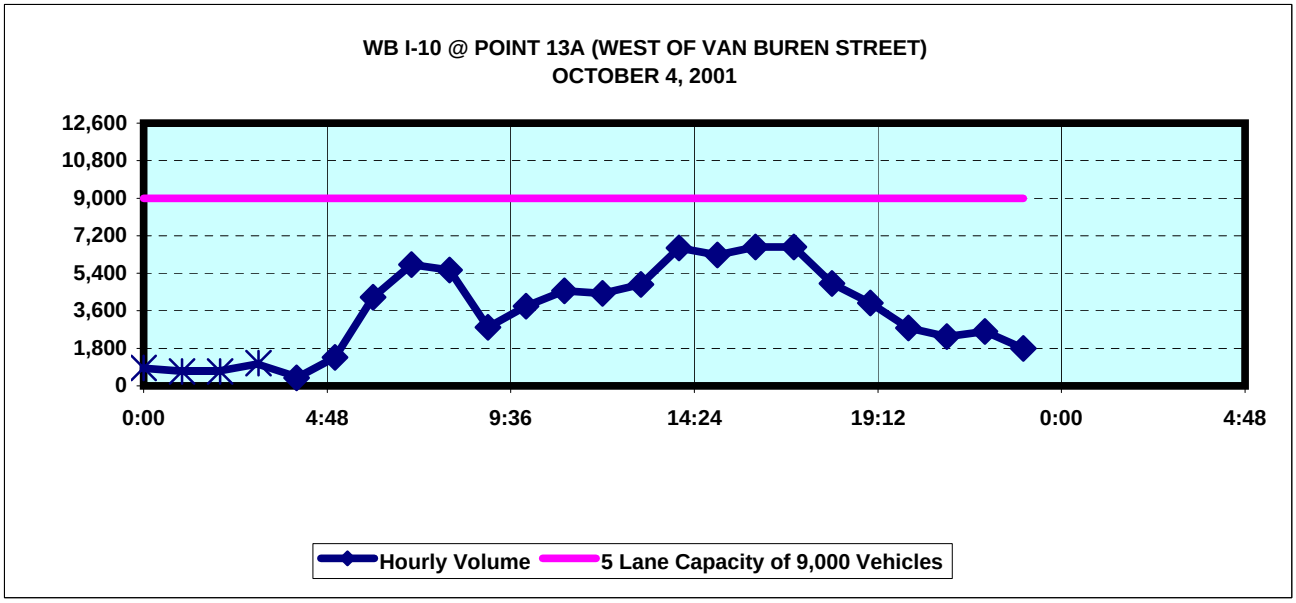

WB 10 @ POINT 151N (NORTH OF RAY ROAD)
OCTOBER 2 AND 3, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
4 Lane Capacity of 7,200 Vehicles

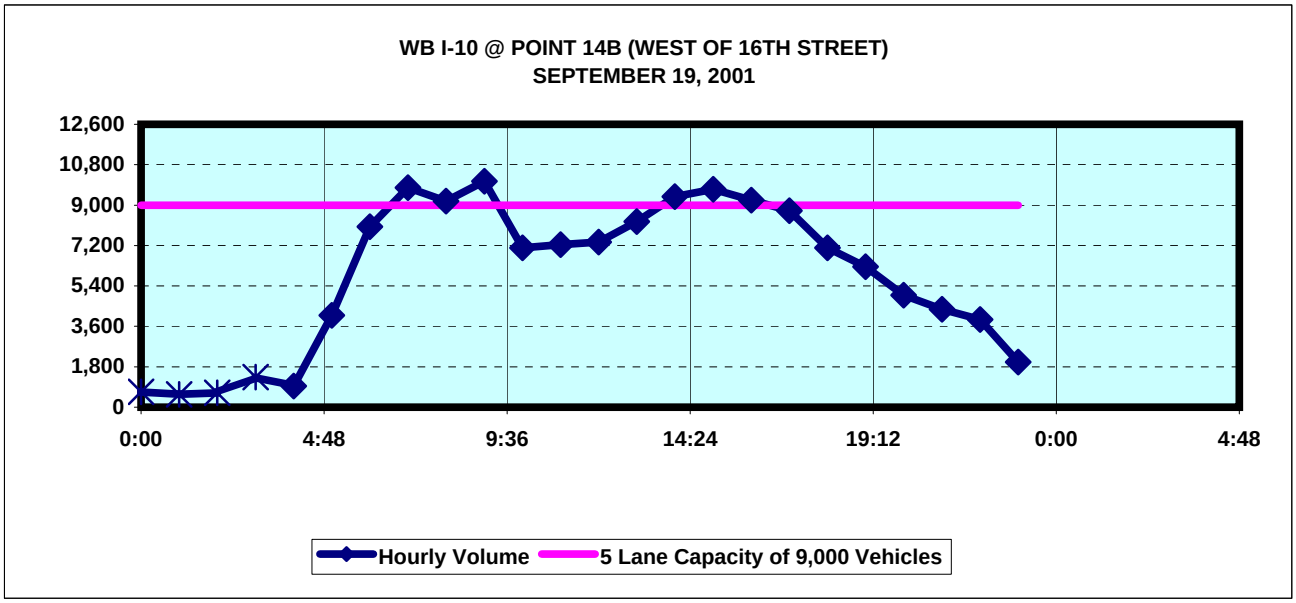

WB I-10 @ POINT 2A (SOUTH OF ELLIOT ROAD)
OCTOBER 9, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
4 Lane Capacity of 7,200 Vehicles

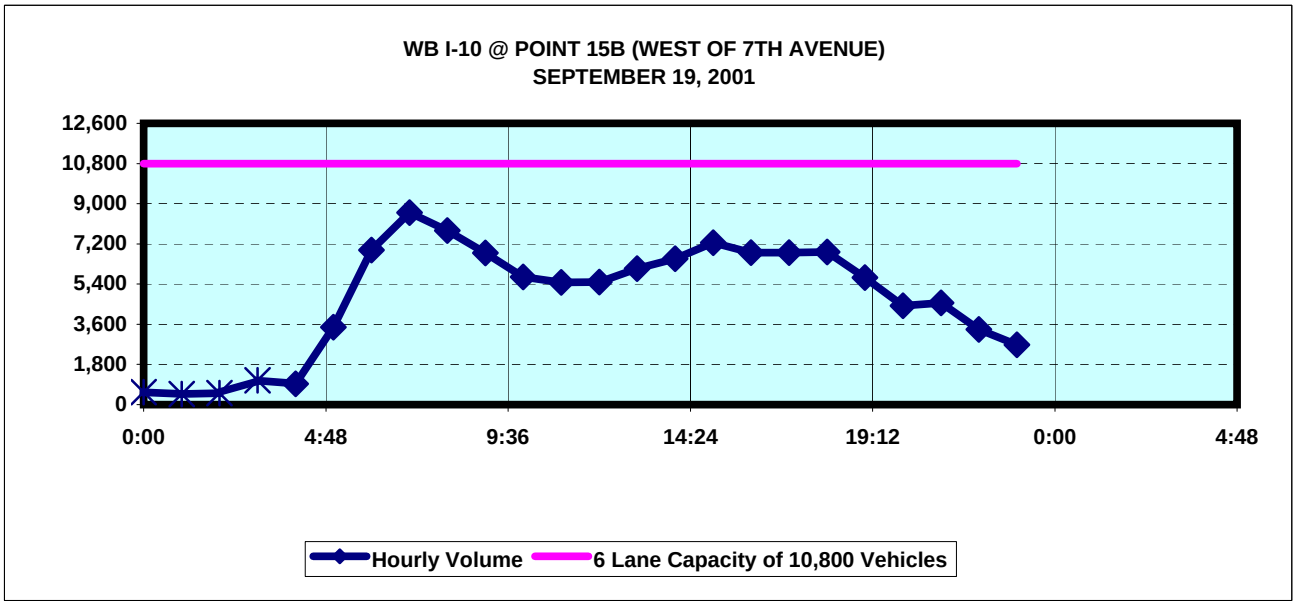

WB 10 @ POINT 152N (NORTH OF GUADALUPE ROAD)
OCTOBER 2 AND 3, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
4 Lane Capacity of 7,200 Vehicles

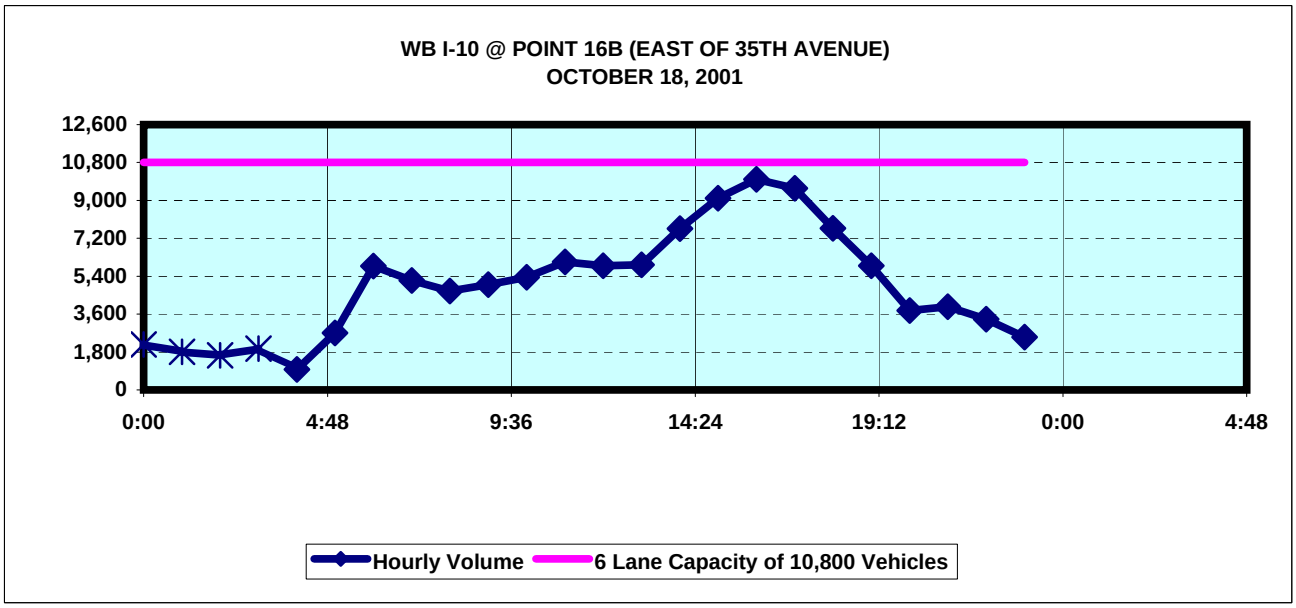

WB I-10 @ POINT 3B (SOUTH OF BROADWAY ROAD)
OCTOBER 9, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
6 Lane Capacity of 10,800 Vehicles

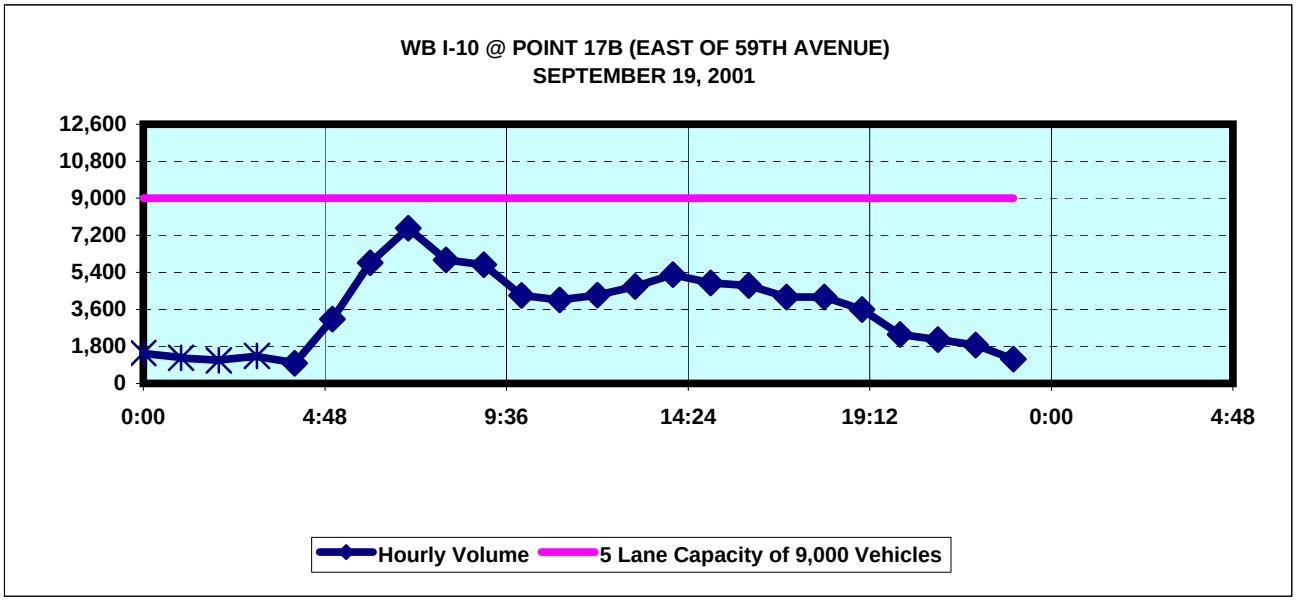

WB I-10 @ POINT 4B (EAST OF 32ND STREET)
SEPTEMBER 20, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
6 Lane Capacity of 10,800 Vehicles

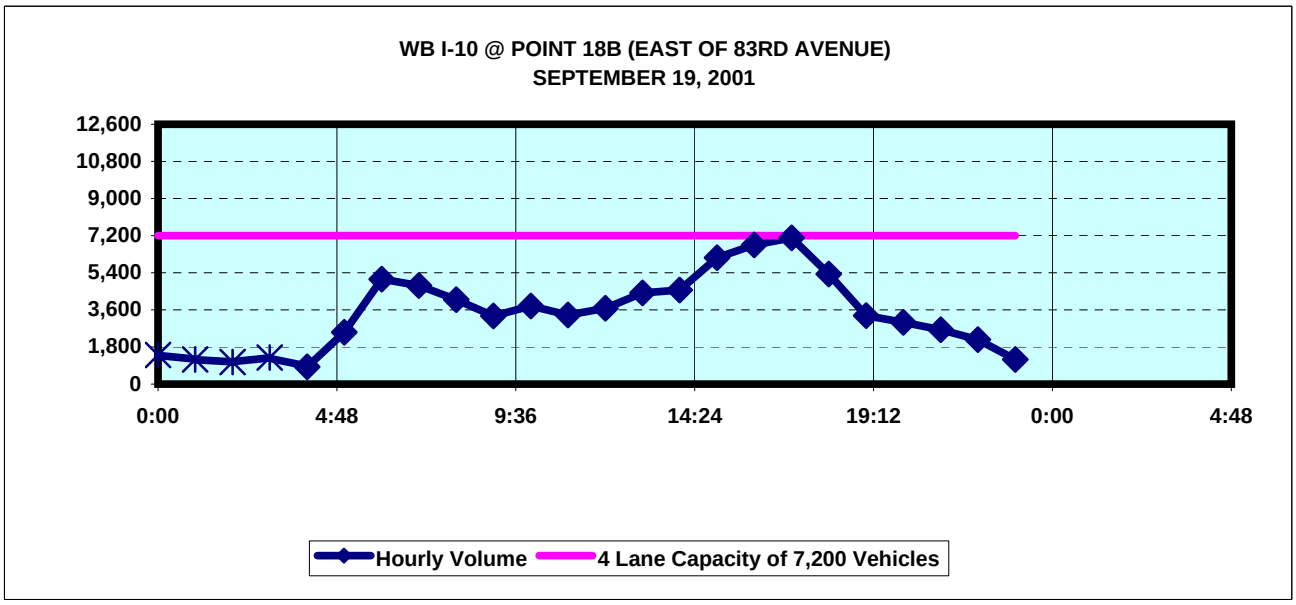

WB I-10 @ POINT 13A (WEST OF VAN BUREN STREET)
OCTOBER 4, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
5 Lane Capacity of 9,000 Vehicles

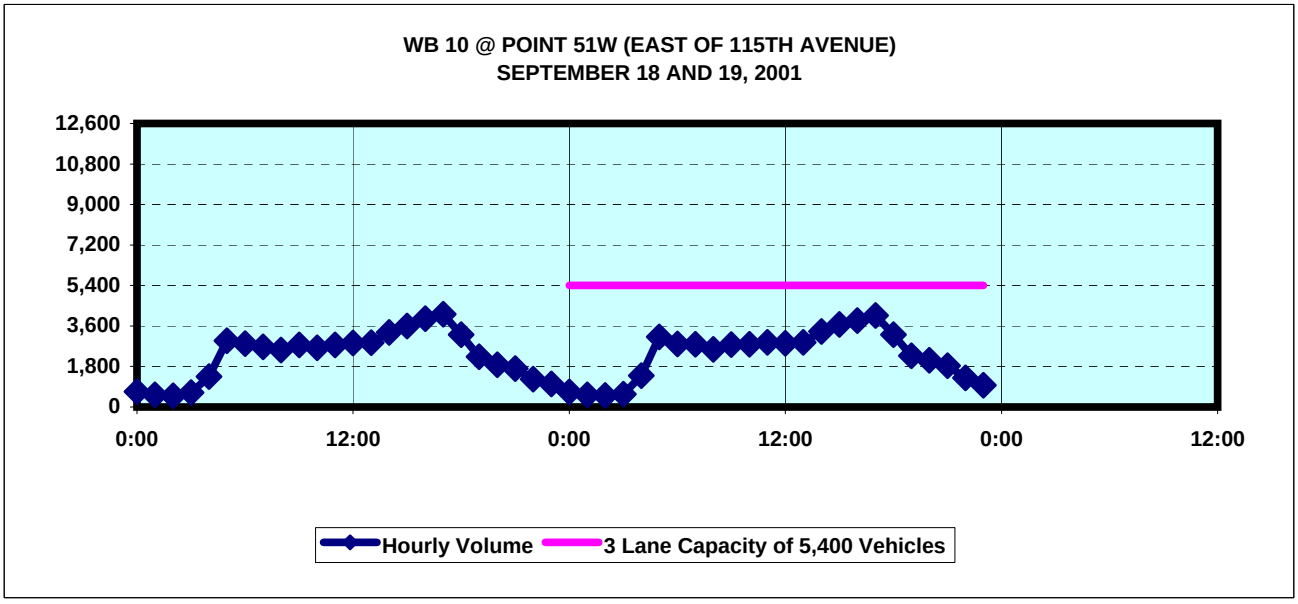

WB I-10 @ POINT 14B (WEST OF 16TH STREET)
SEPTEMBER 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
5 Lane Capacity of 9,000 Vehicles

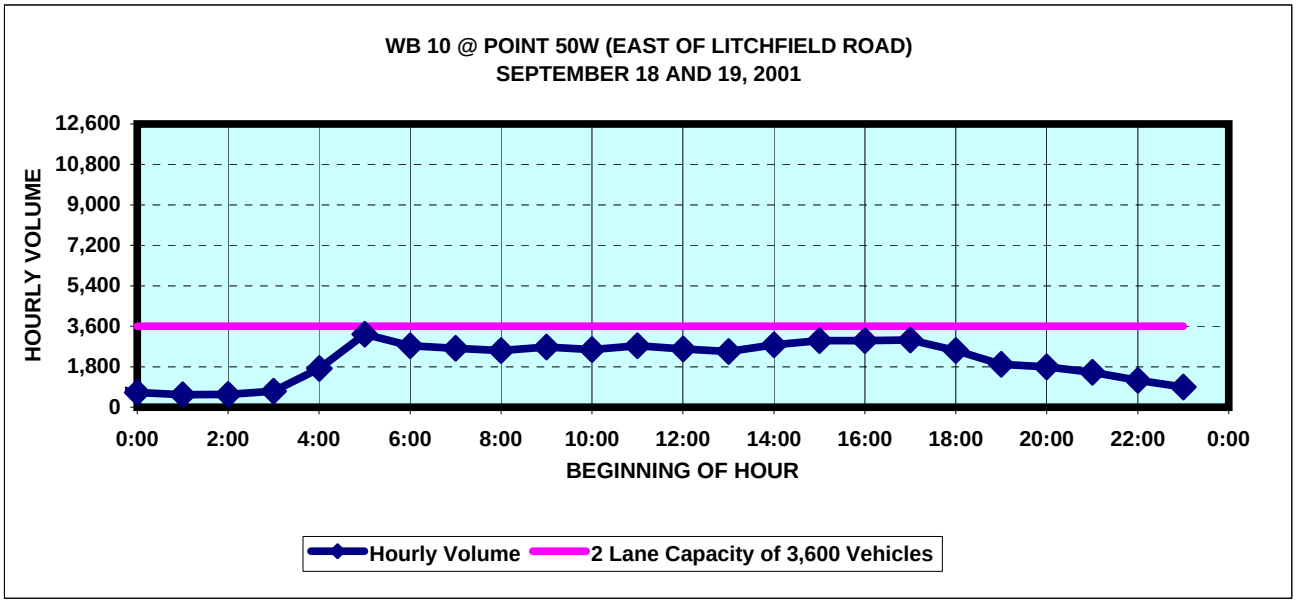

WB I-10 @ POINT 15B (WEST OF 7TH AVENUE)
SEPTEMBER 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
6 Lane Capacity of 10,800 Vehicles

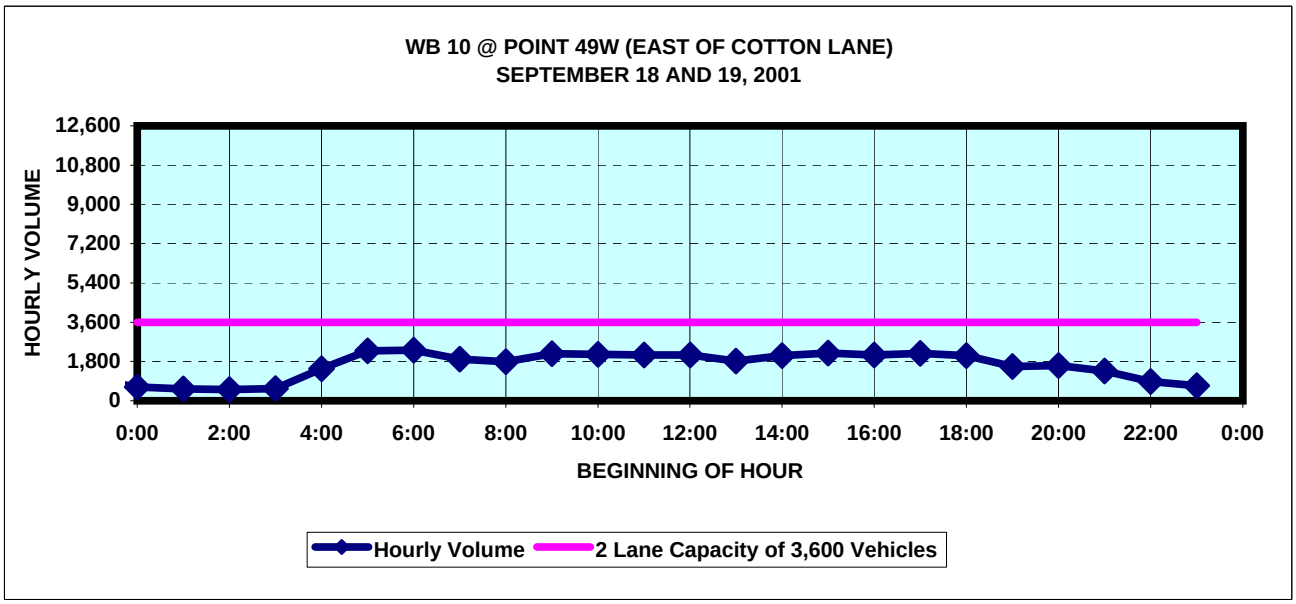

WB I-10 @ POINT 16B (EAST OF 35TH AVENUE)
OCTOBER 18, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
6 Lane Capacity of 10,800 Vehicles

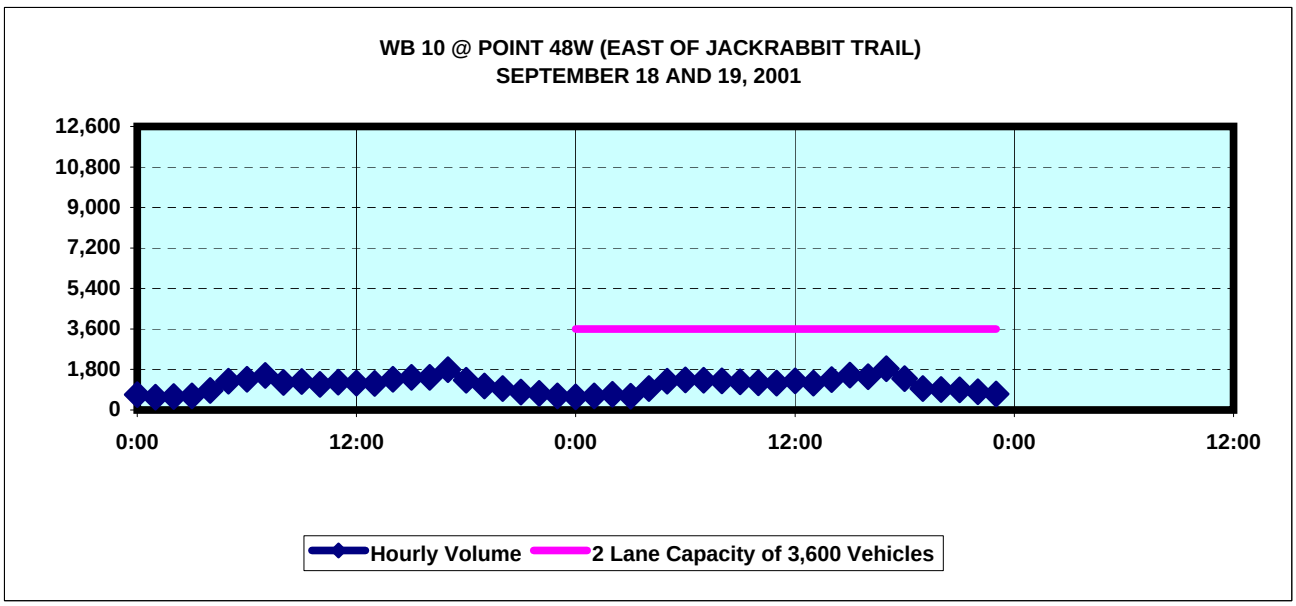

WB I-10 @ POINT 17B (EAST OF 59TH AVENUE)
SEPTEMBER 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
5 Lane Capacity of 9,000 Vehicles

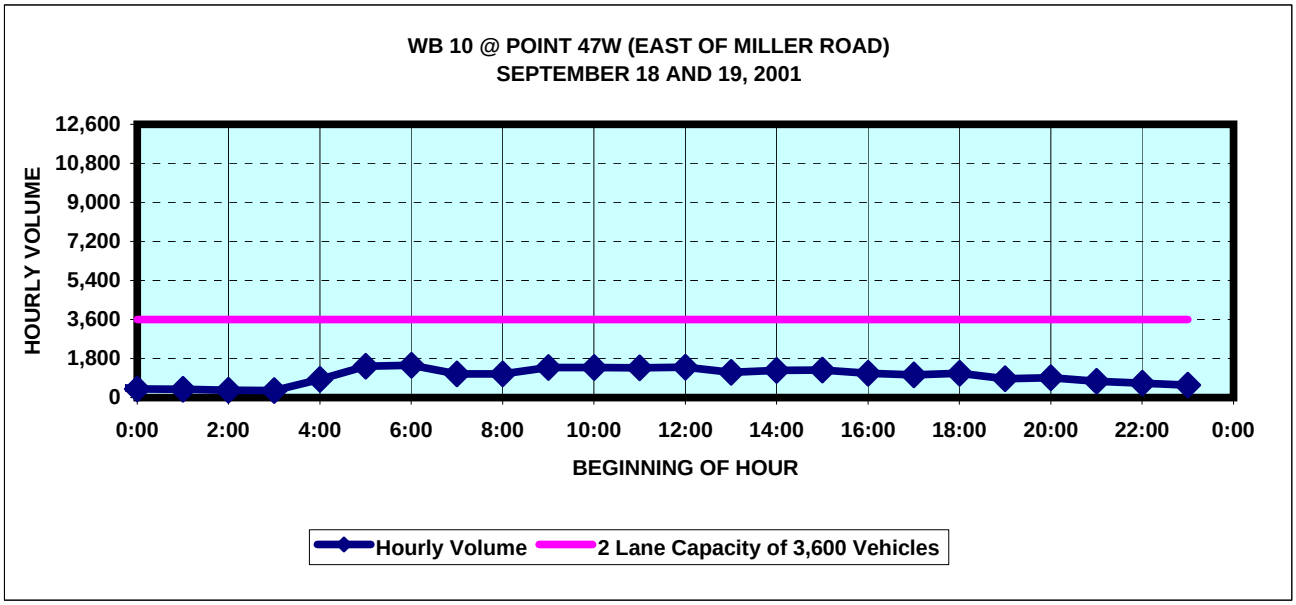

WB I-10 @ POINT 18B (EAST OF 83RD AVENUE)
SEPTEMBER 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
4:48
9:36
14:24
19:12
0:00
4:48
Hourly Volume
4 Lane Capacity of 7,200 Vehicles

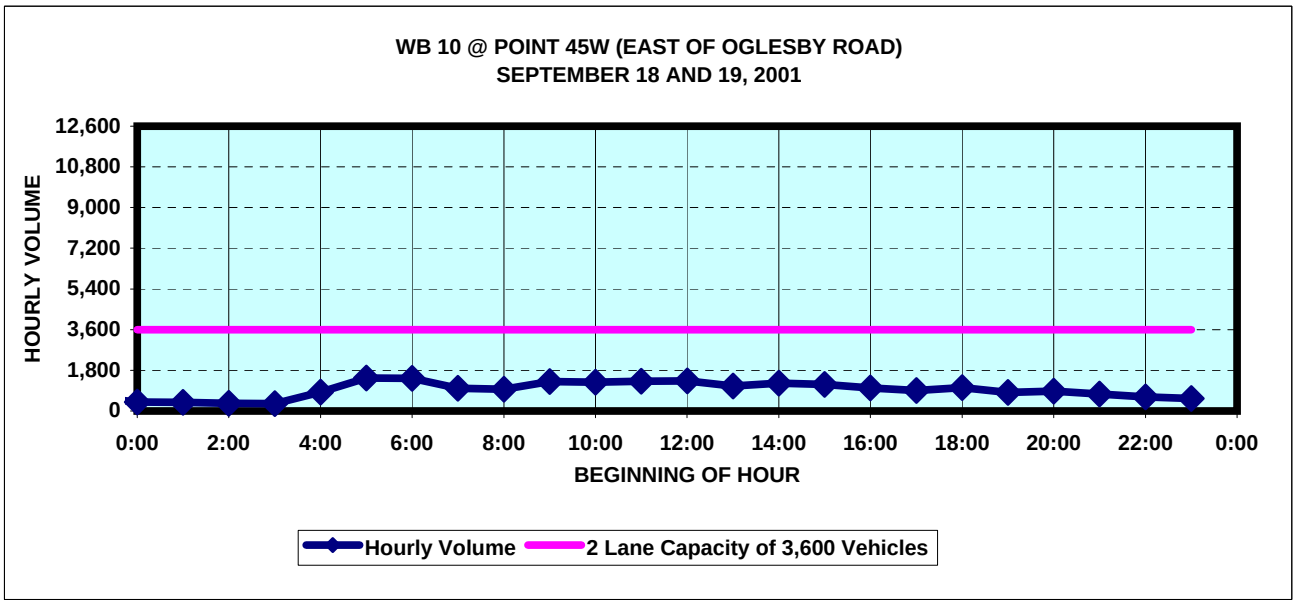

WB 10 @ POINT 51W (EAST OF 115TH AVENUE)
SEPTEMBER 18 AND 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
3 Lane Capacity of 5,400 Vehicles


WB 10 @ POINT 50W (EAST OF LITCHFIELD ROAD)
SEPTEMBER 18 AND 19, 2001
HOURLY VOLUME
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
BEGINNING OF HOUR
Hourly Volume
2 Lane Capacity of 3,600 Vehicles


WB 10 @ POINT 49W (EAST OF COTTON LANE)
SEPTEMBER 18 AND 19, 2001
HOURLY VOLUME
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
BEGINNING OF HOUR
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

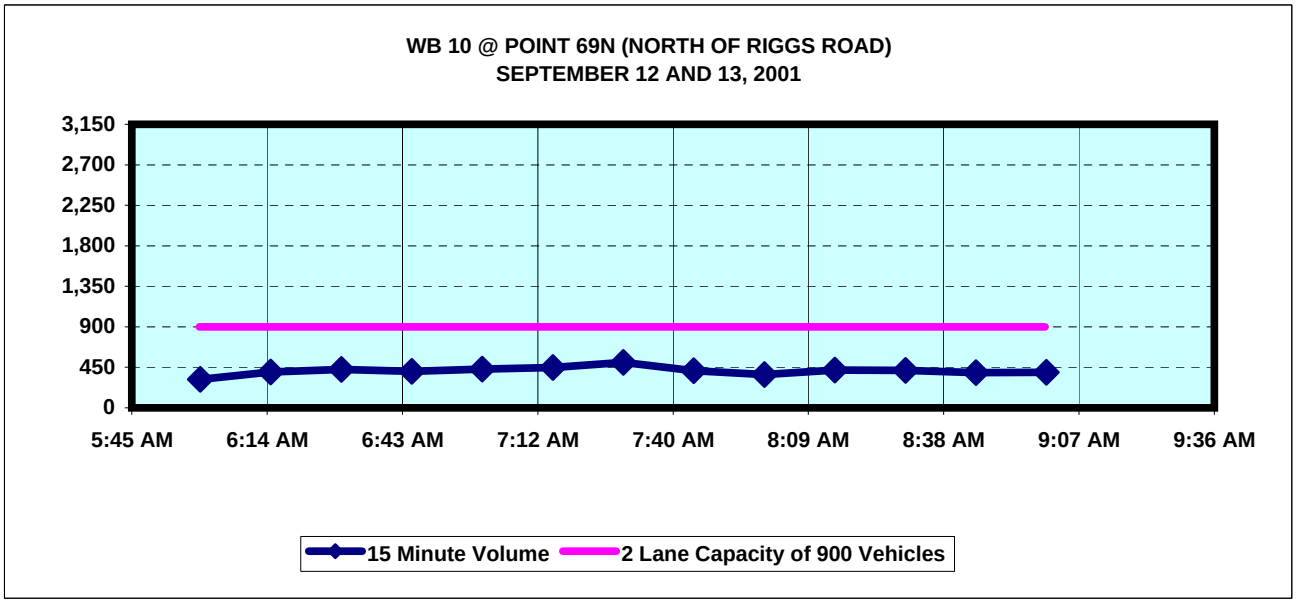

WB 10 @ POINT 48W (EAST OF JACKRABBIT TRAIL)
SEPTEMBER 18 AND 19, 2001
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
12:00
0:00
12:00
0:00
12:00
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

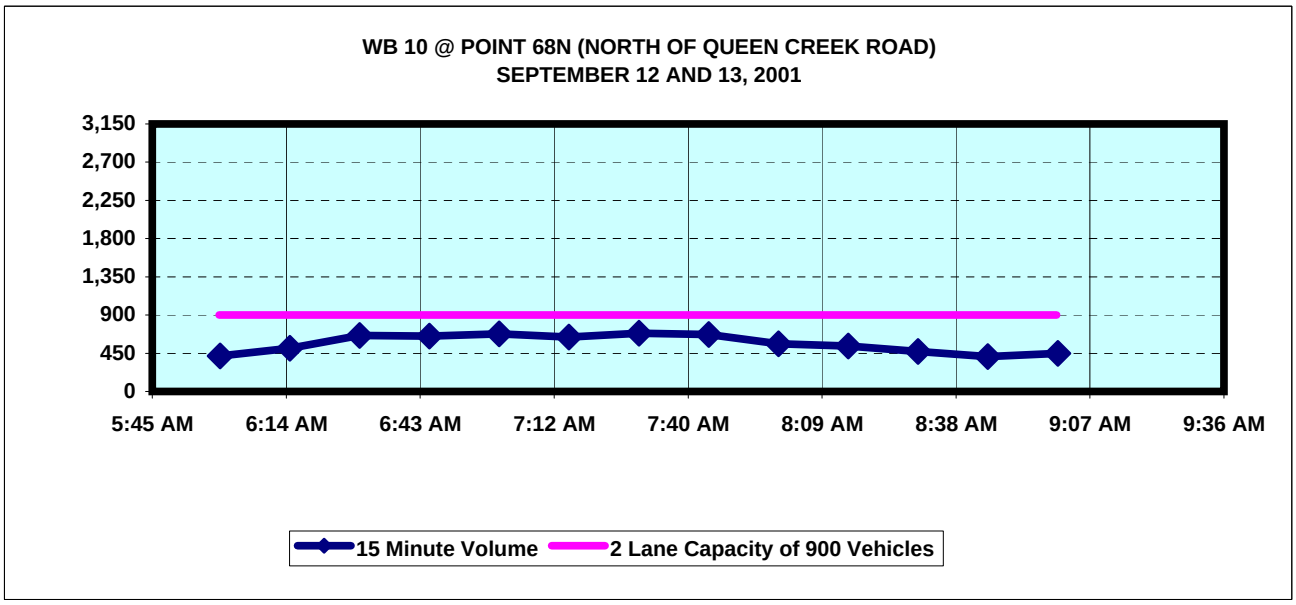

WB 10 @ POINT 47W (EAST OF MILLER ROAD)
SEPTEMBER 18 AND 19, 2001
HOURLY VOLUME
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
BEGINNING OF HOUR
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

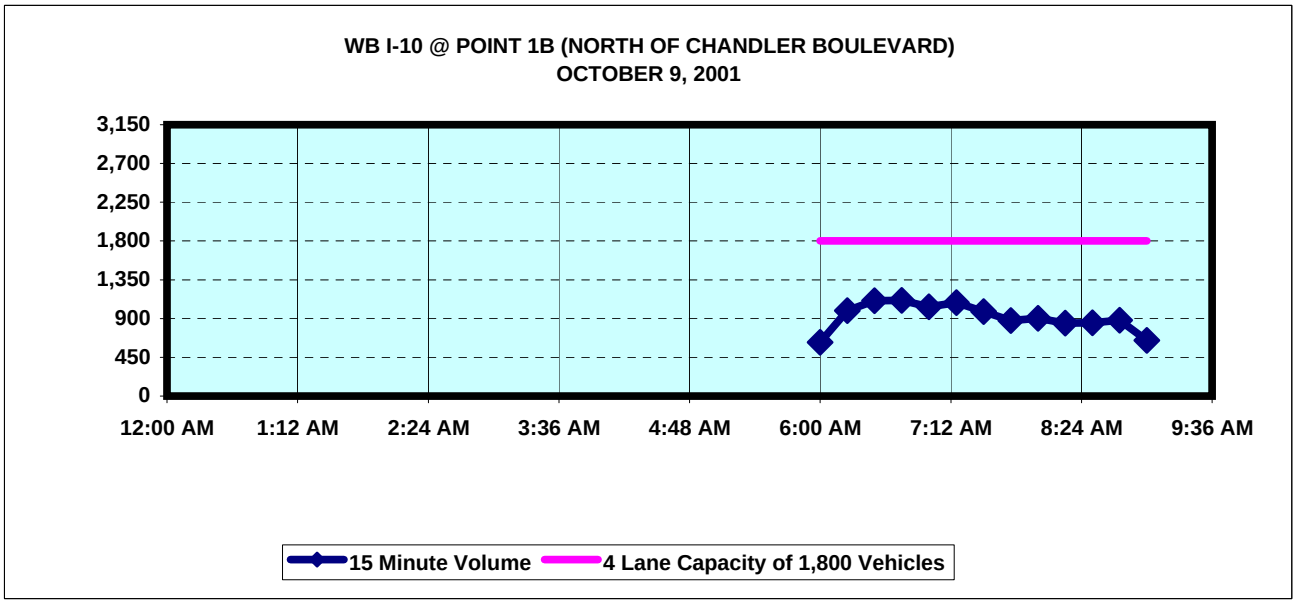

WB 10 @ POINT 45W (EAST OF OGLESBY ROAD)
SEPTEMBER 18 AND 19, 2001
HOURLY VOLUME
12,600
10,800
9,000
7,200
5,400
3,600
1,800
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
BEGINNING OF HOUR
Hourly Volume
2 Lane Capacity of 3,600 Vehicles

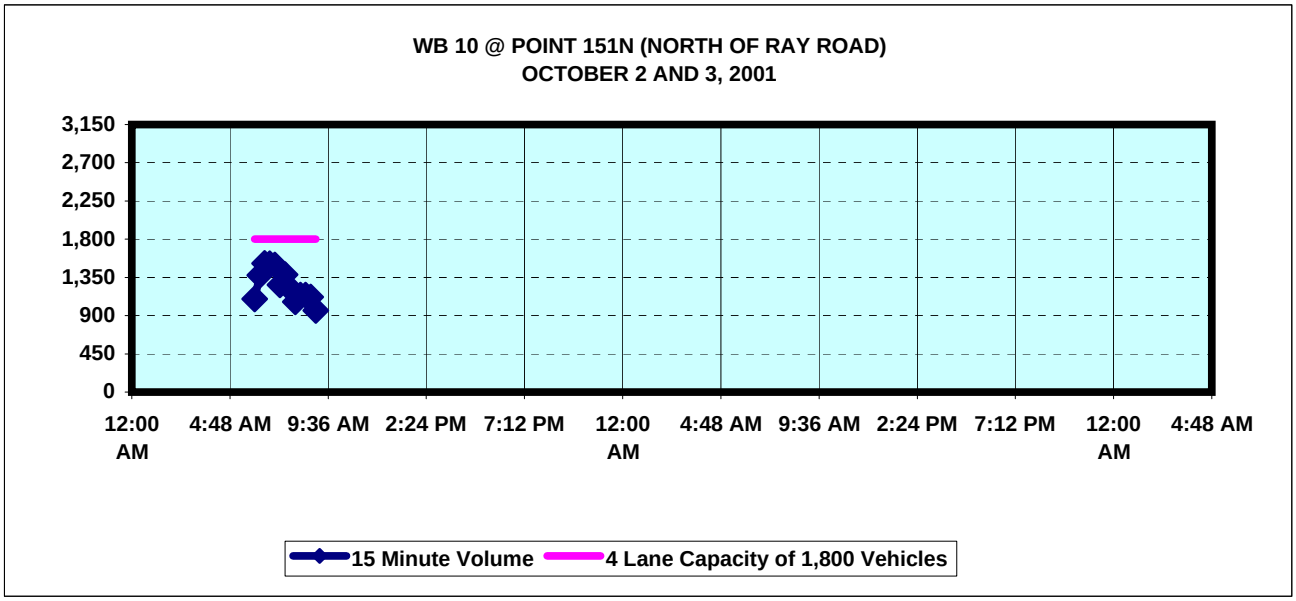
APPENDIX E

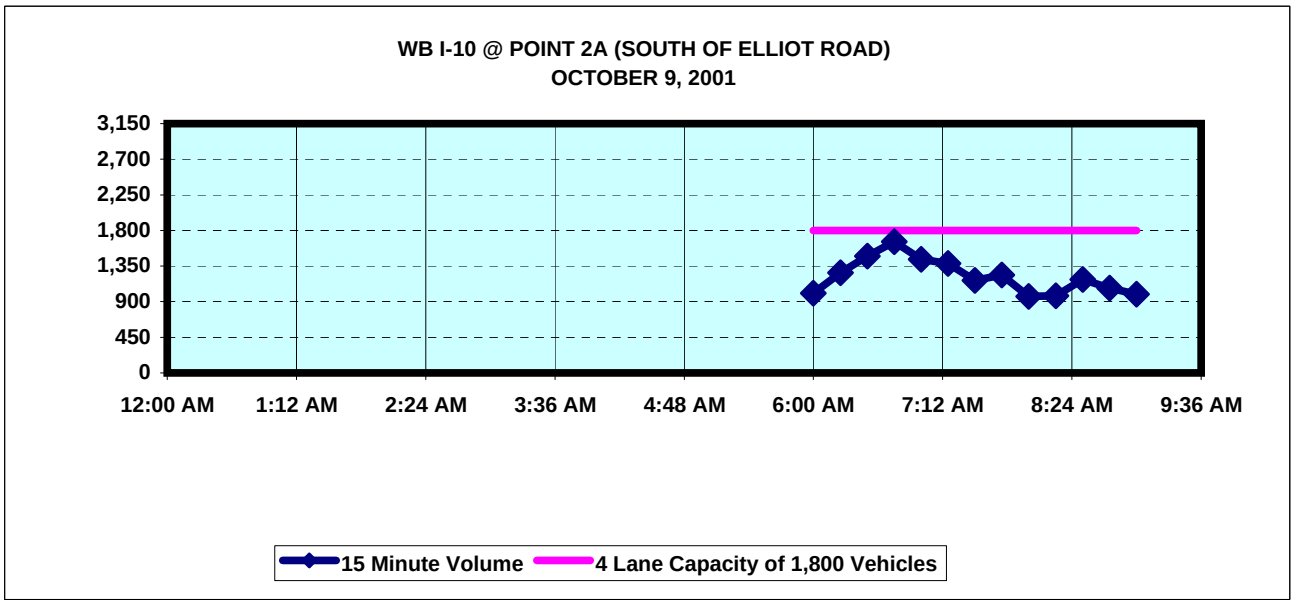
I-10 WESTBOUND
AM PEAK TRAFFIC VOLUMES

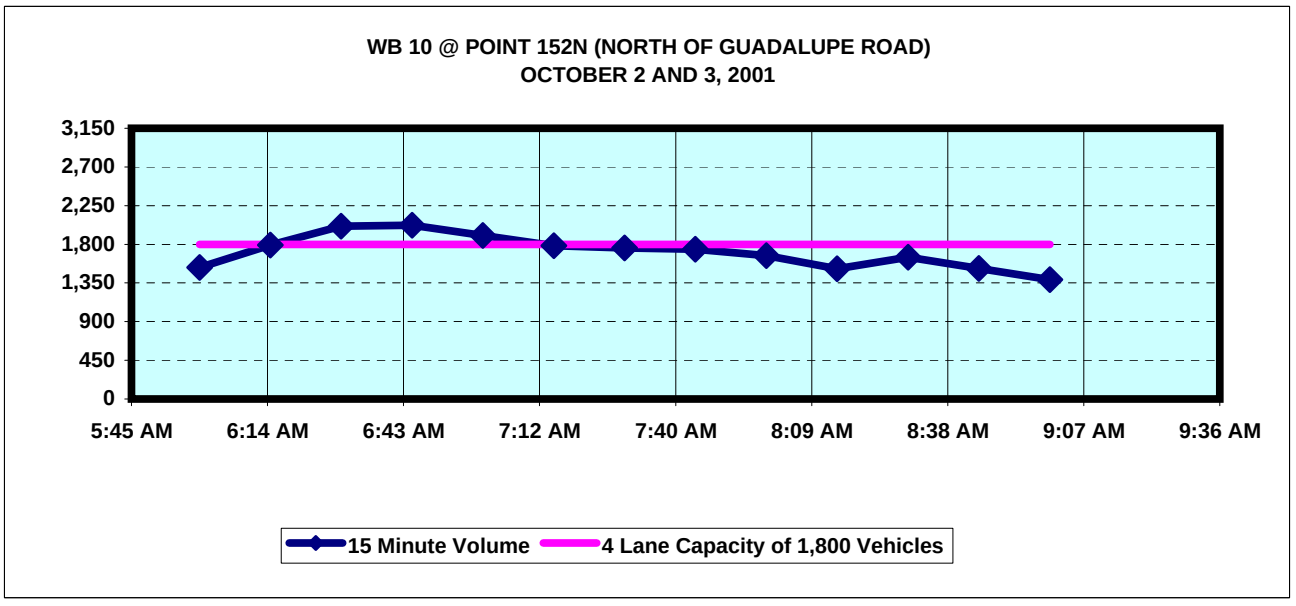

WB 10 @ POINT 69N (NORTH OF RIGGS ROAD)
SEPTEMBER 12 AND 13, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles

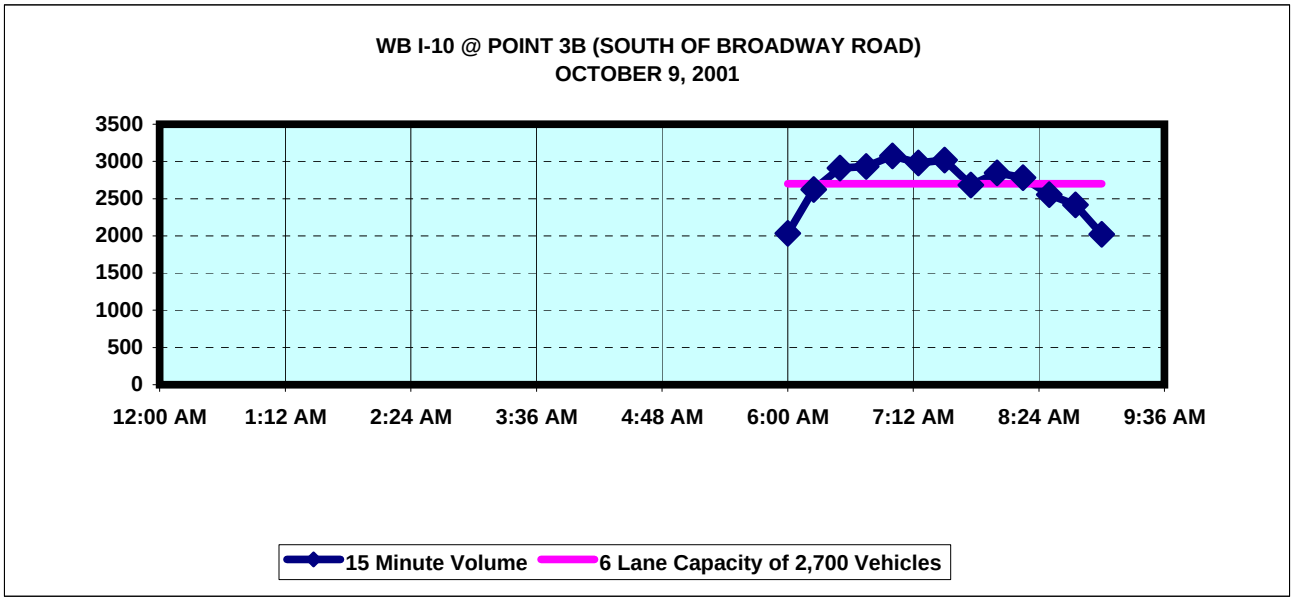

WB 10 @ POINT 68N (NORTH OF QUEEN CREEK ROAD)
SEPTEMBER 12 AND 13, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles

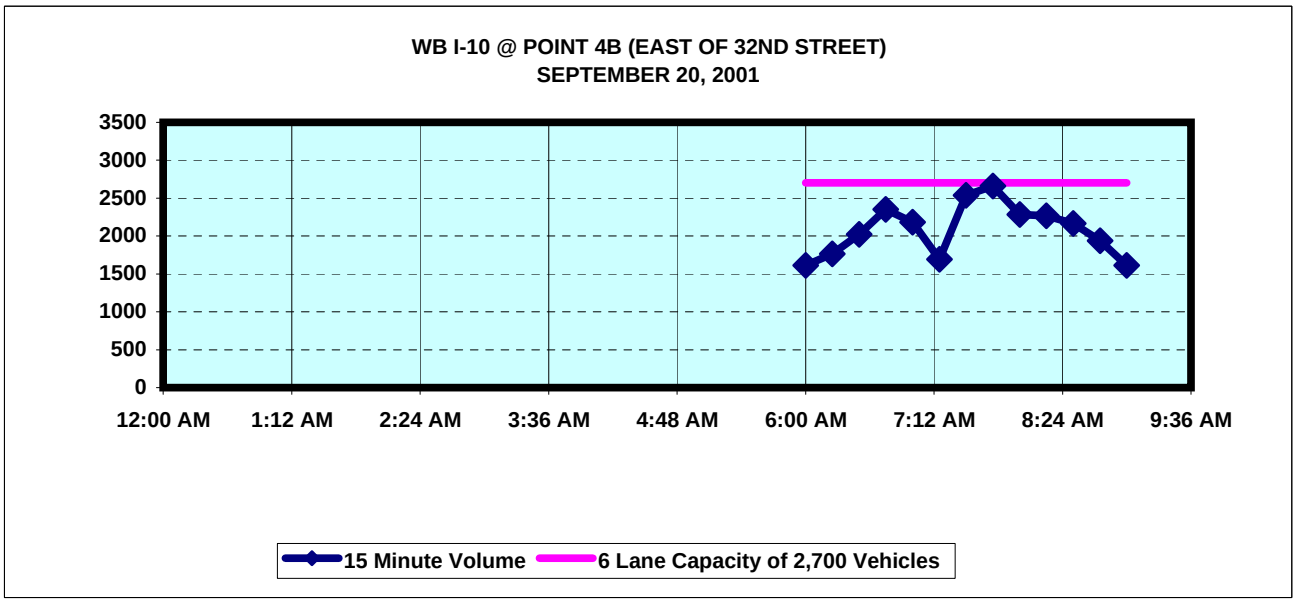

WB I-10 @ POINT 1B (NORTH OF CHANDLER BOULEVARD)
OCTOBER 9, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

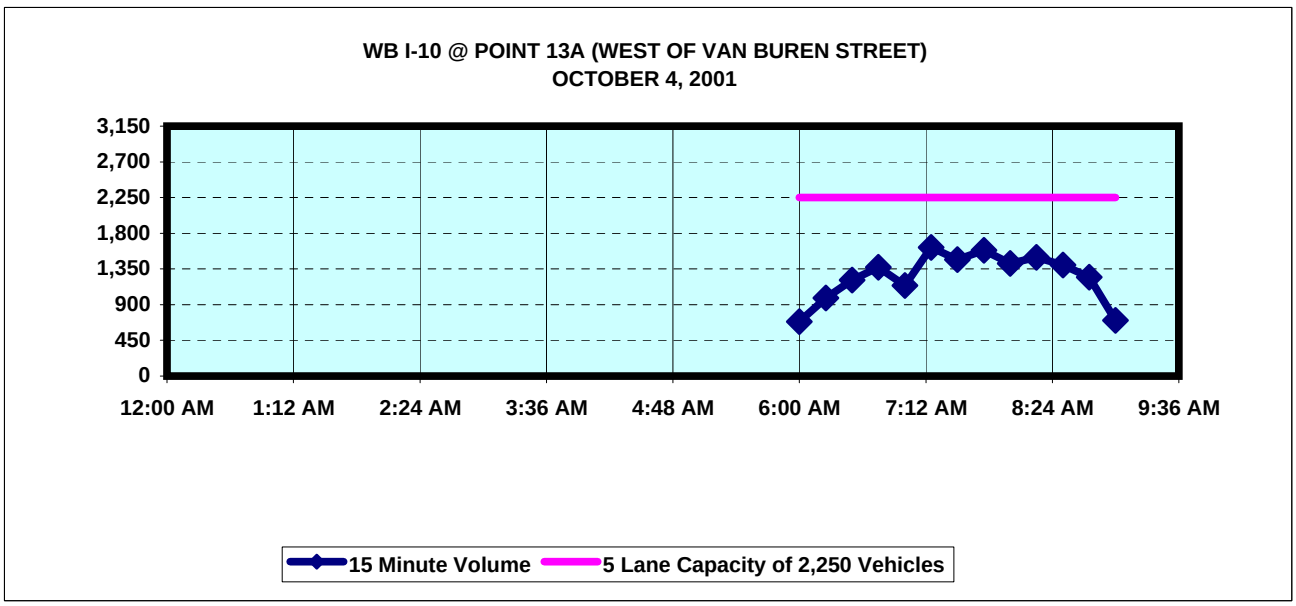

WB 10 @ POINT 151N (NORTH OF RAY ROAD)
OCTOBER 2 AND 3, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
4:48 AM
9:36 AM
2:24 PM
7:12 PM
12:00 AM
4:48 AM
9:36 AM
2:24 PM
7:12 PM
12:00 AM
4:48 AM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

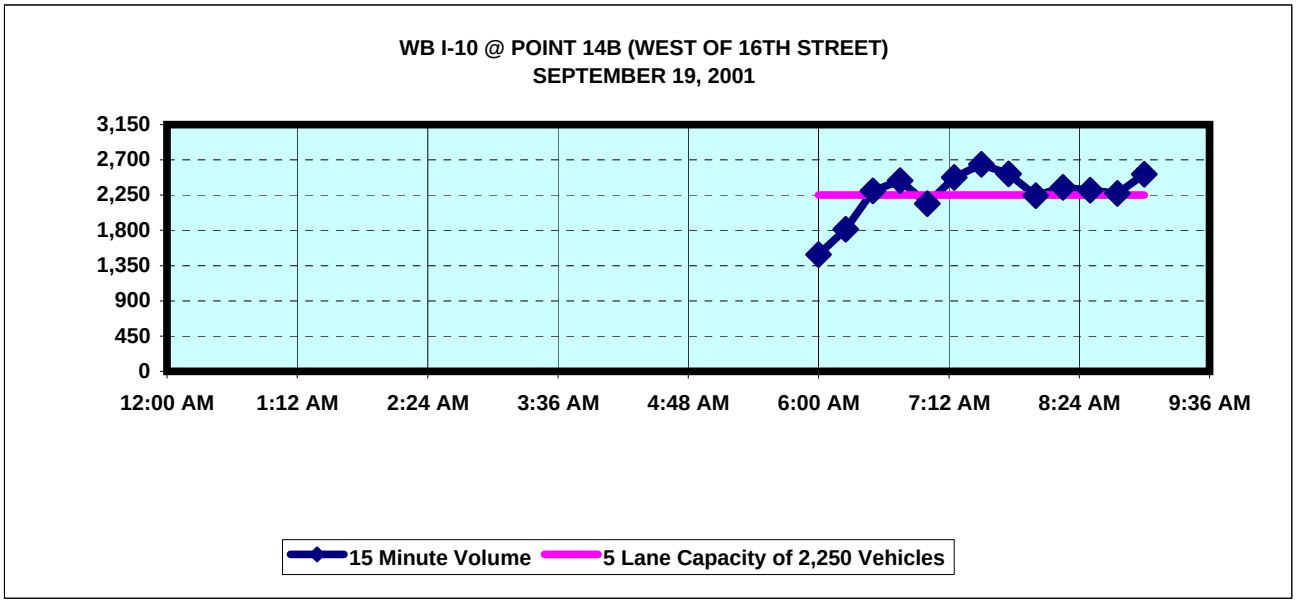

WB I-10 @ POINT 2A (SOUTH OF ELLIOT ROAD)
OCTOBER 9, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

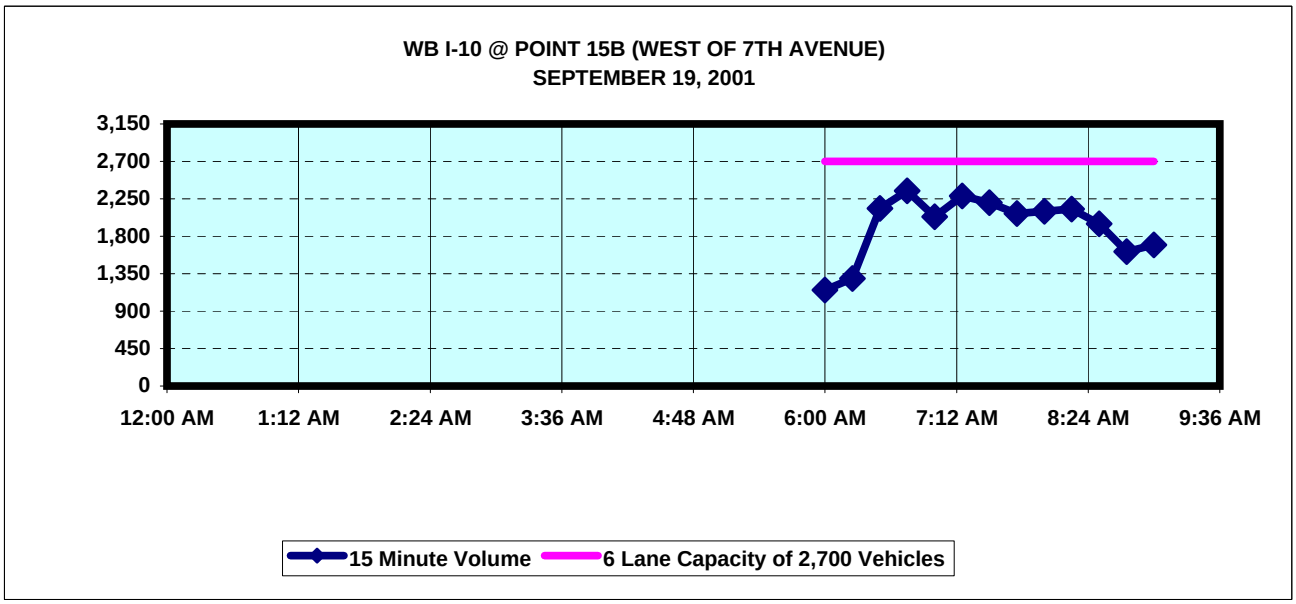

WB 10 @ POINT 152N (NORTH OF GUADALUPE ROAD)
OCTOBER 2 AND 3, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

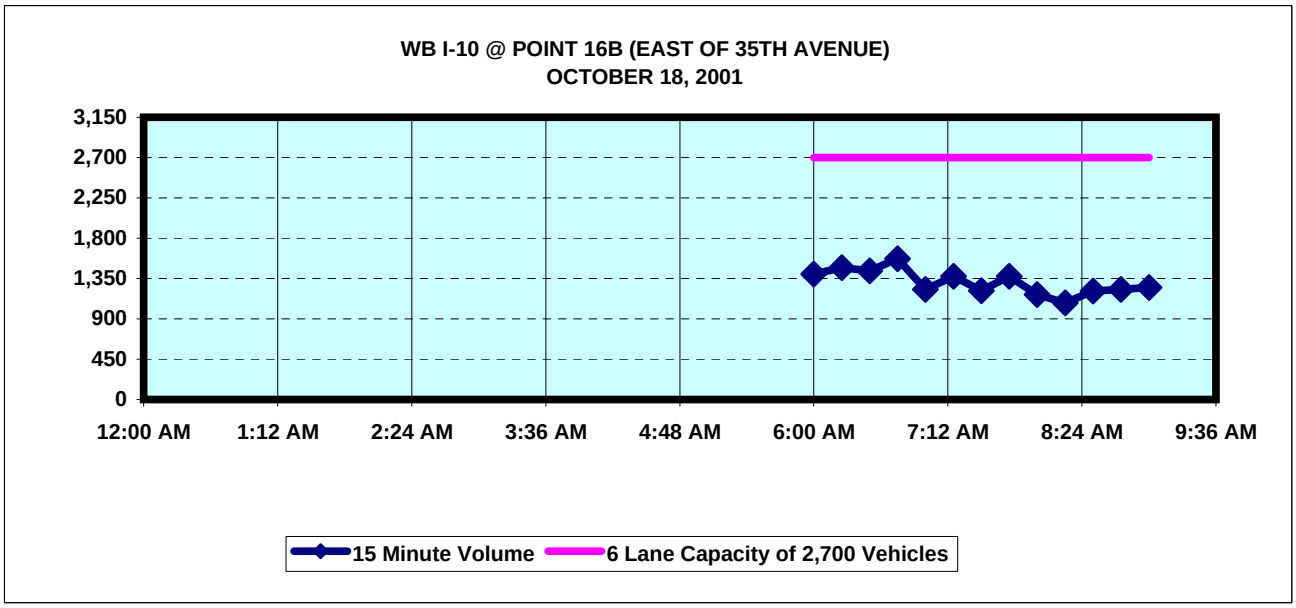

WB I-10 @ POINT 3B (SOUTH OF BROADWAY ROAD)
OCTOBER 9, 2001
3500
3000
2500
2000
1500
1000
500
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

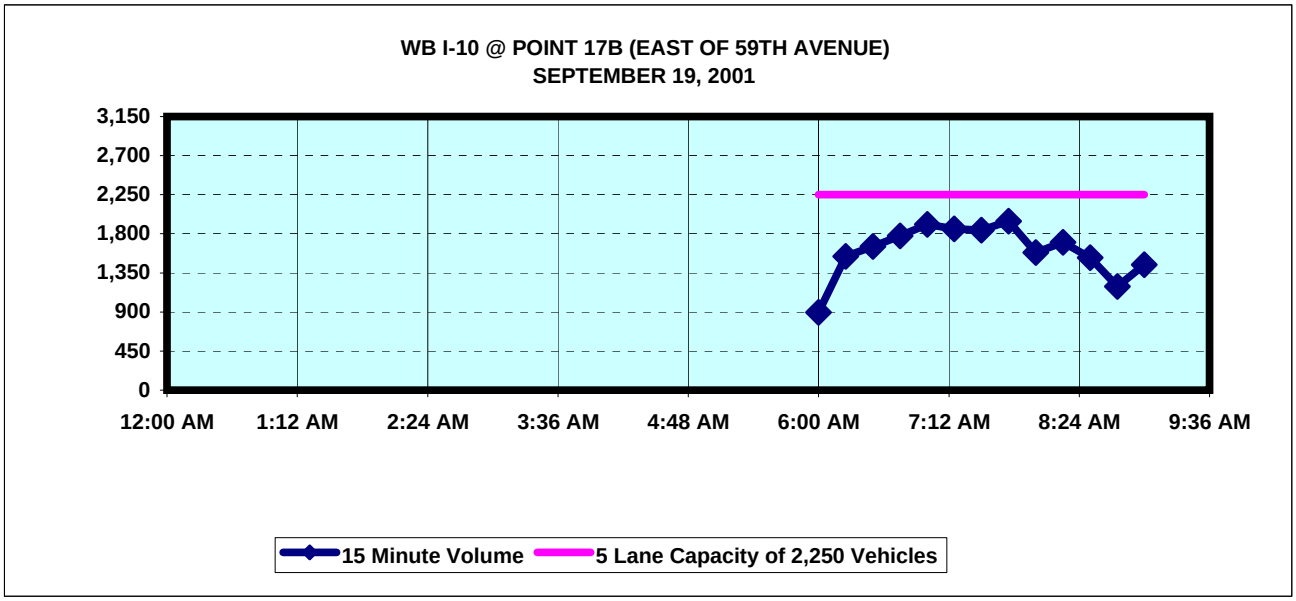

WB I-10 @ POINT 4B (EAST OF 32ND STREET)
SEPTEMBER 20, 2001
3500
3000
2500
2000
1500
1000
500
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

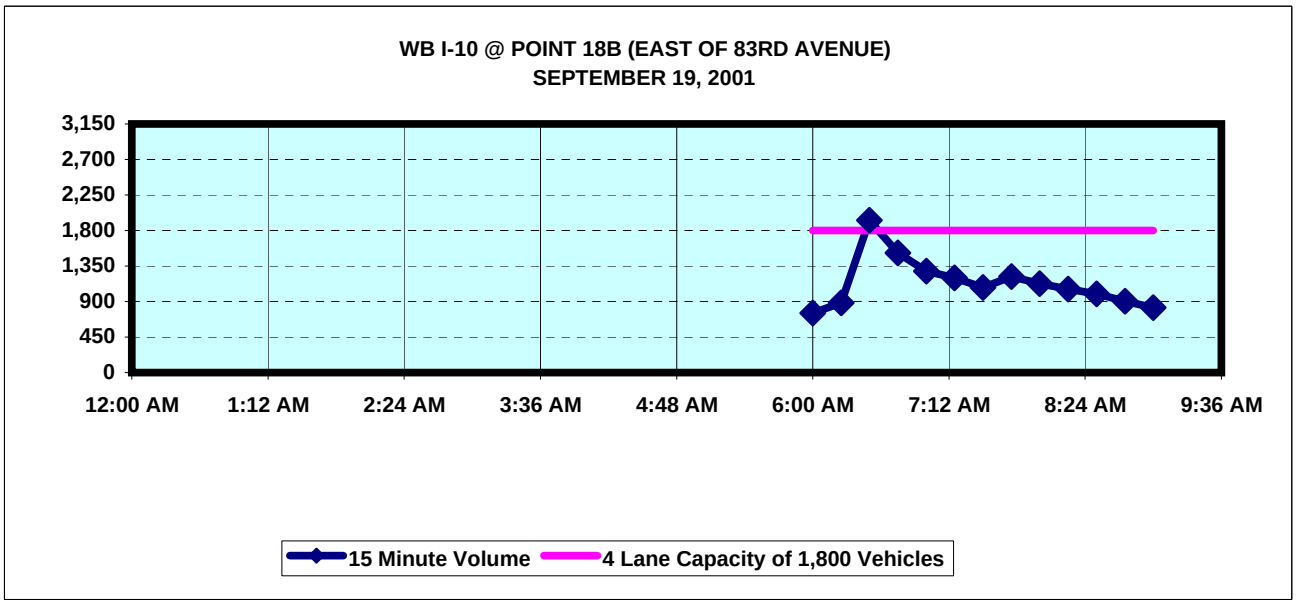

WB I-10 @ POINT 13A (WEST OF VAN BUREN STREET)
OCTOBER 4, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
5 Lane Capacity of 2,250 Vehicles

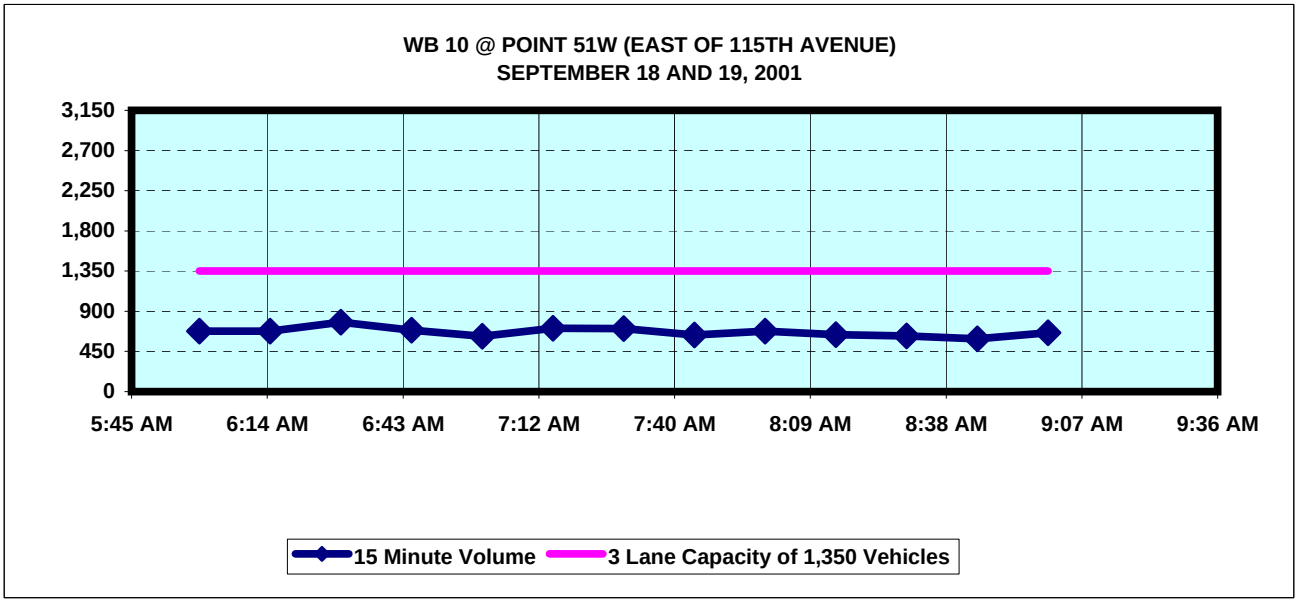

WB I-10 @ POINT 14B (WEST OF 16TH STREET)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
5 Lane Capacity of 2,250 Vehicles

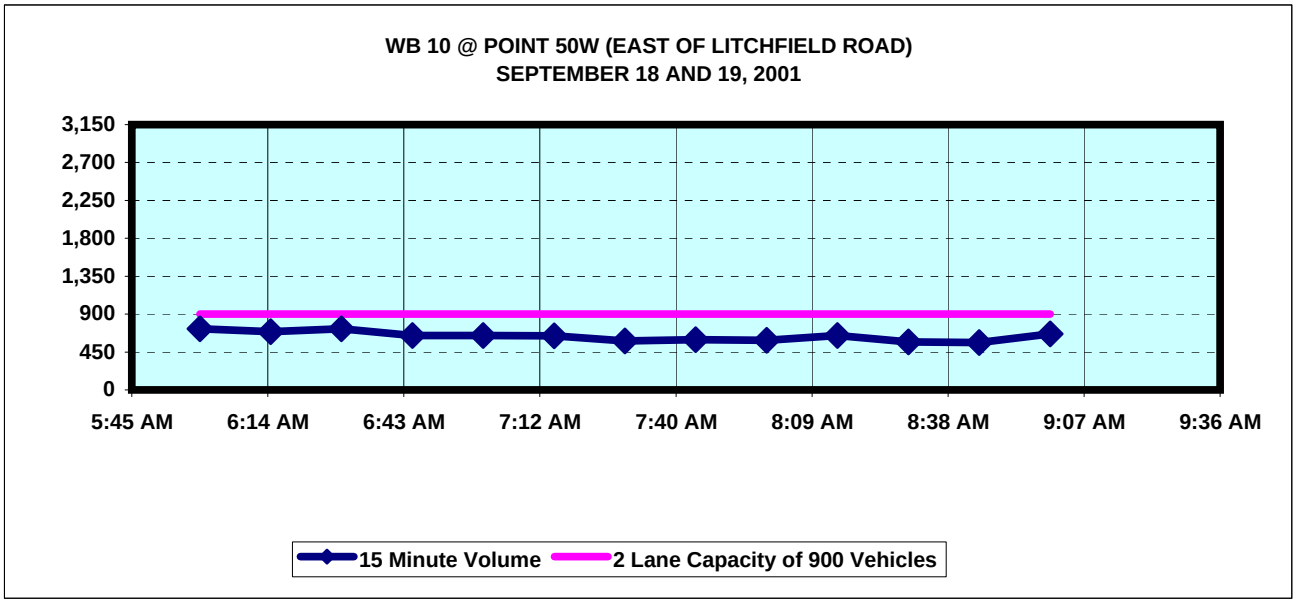

WB I-10 @ POINT 15B (WEST OF 7TH AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

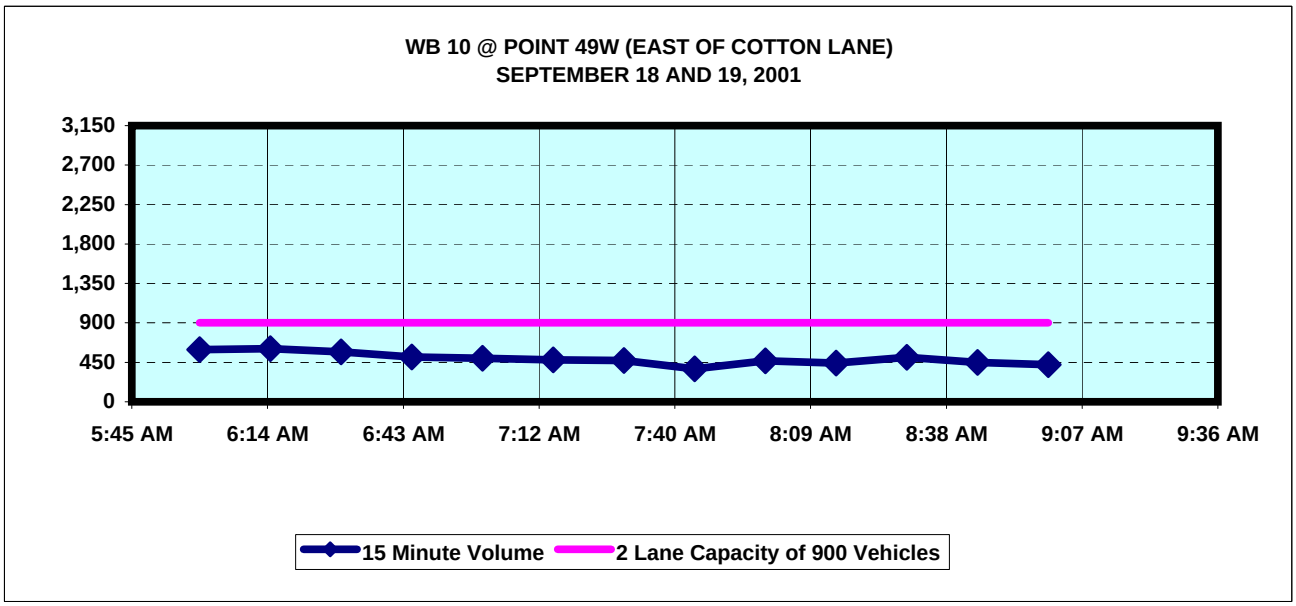

WB I-10 @ POINT 16B (EAST OF 35TH AVENUE)
OCTOBER 18, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

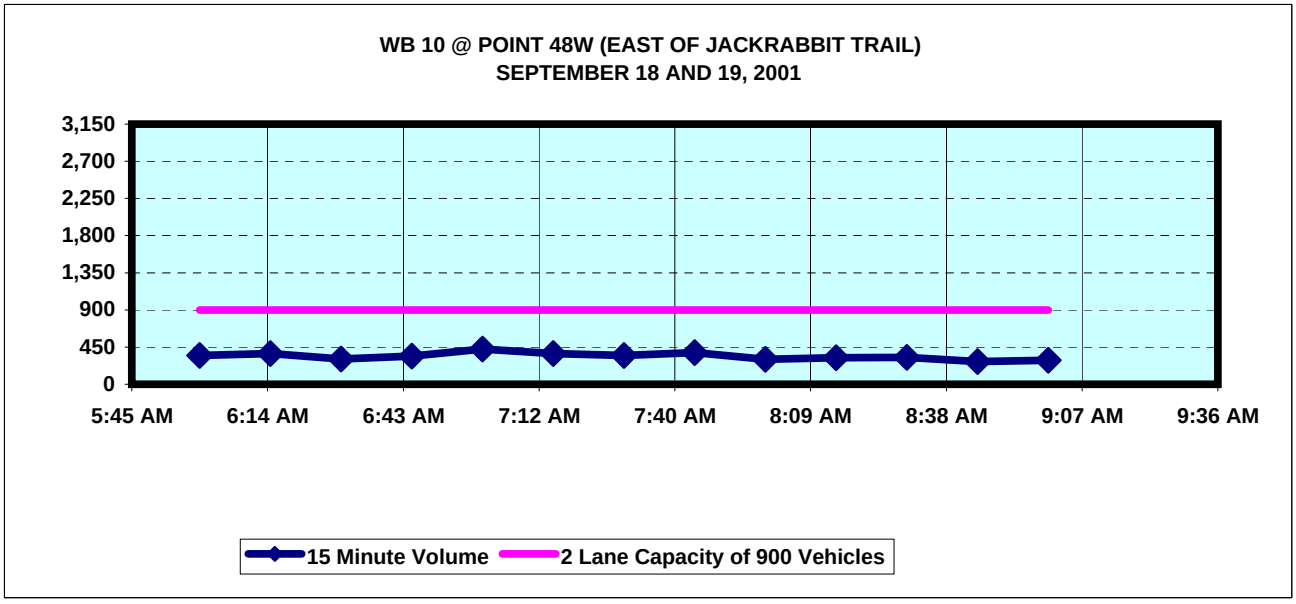

WB I-10 @ POINT 17B (EAST OF 59TH AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
5 Lane Capacity of 2,250 Vehicles

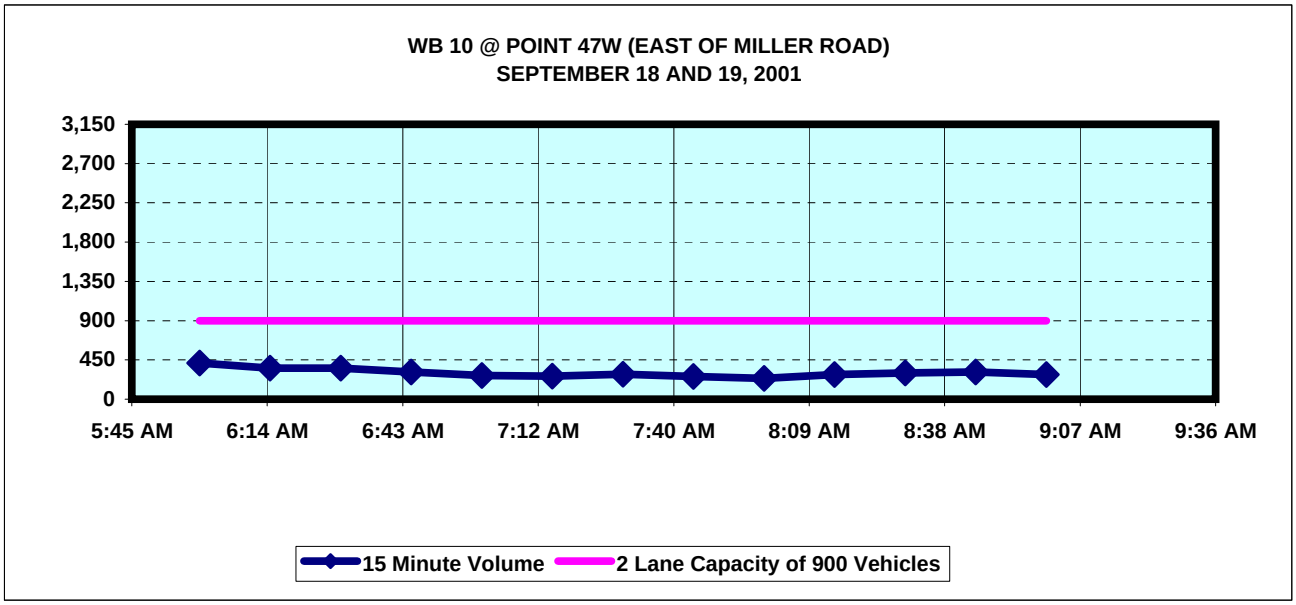

WB I-10 @ POINT 18B (EAST OF 83RD AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
1:12 AM
2:24 AM
3:36 AM
4:48 AM
6:00 AM
7:12 AM
8:24 AM
9:36 AM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

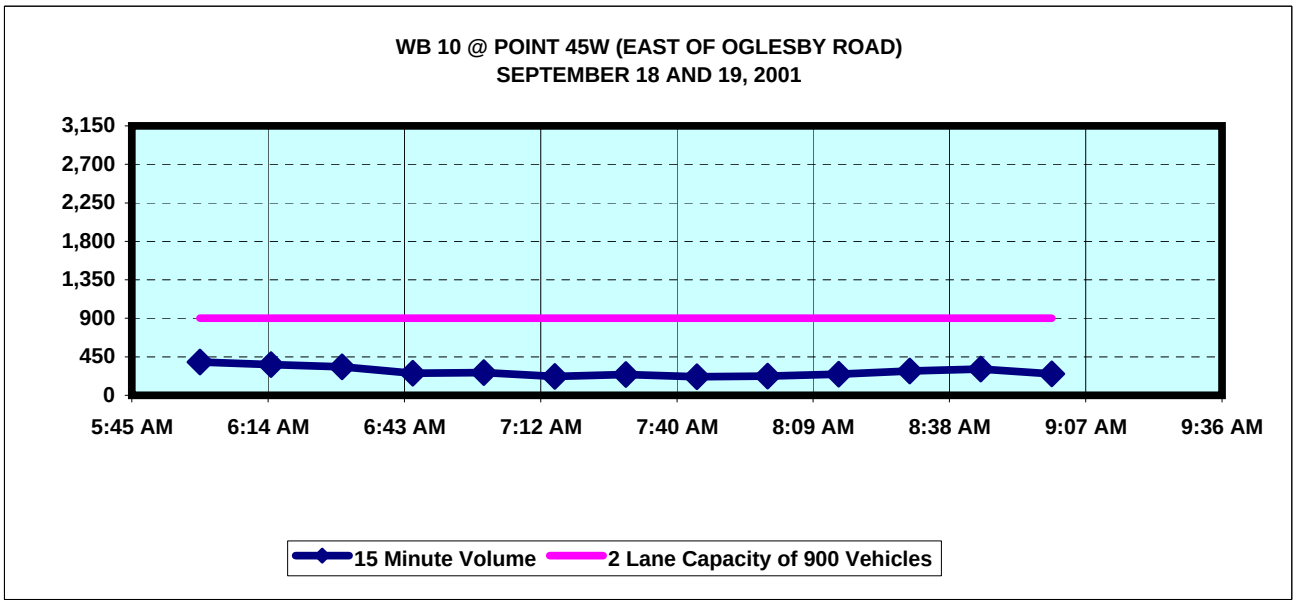

WB 10 @ POINT 51W (EAST OF 115TH AVENUE)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
3 Lane Capacity of 1,350 Vehicles


WB 10 @ POINT 50W (EAST OF LITCHFIELD ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 49W (EAST OF COTTON LANE)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 48W (EAST OF JACKRABBIT TRAIL)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles

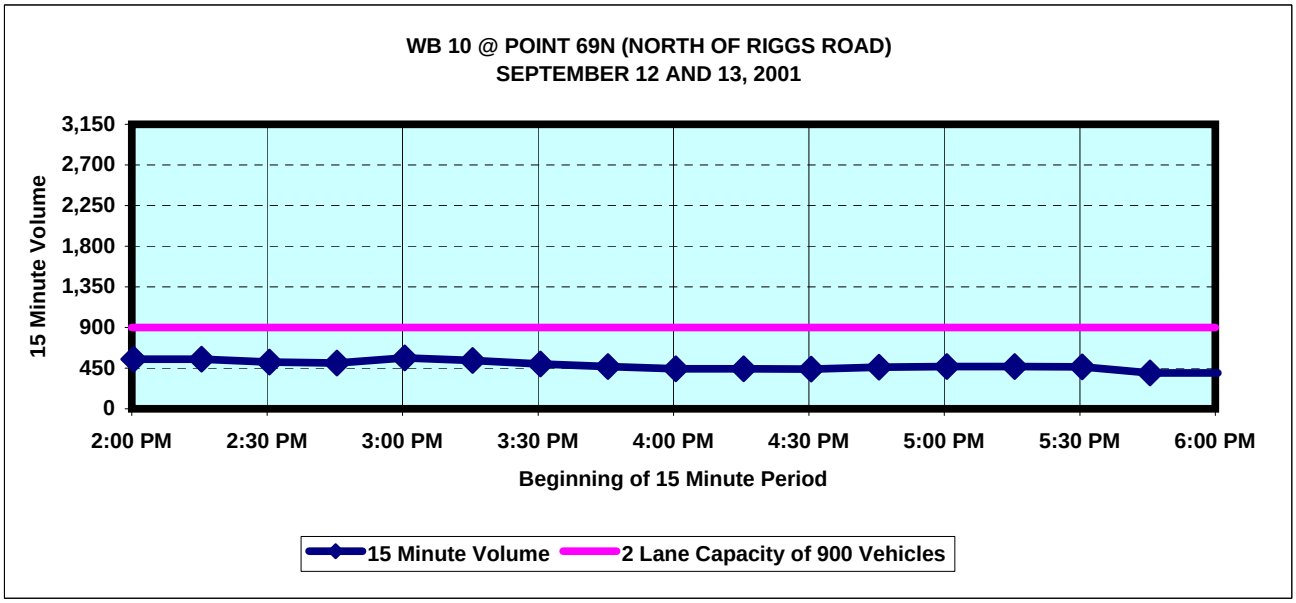

WB 10 @ POINT 47W (EAST OF MILLER ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles

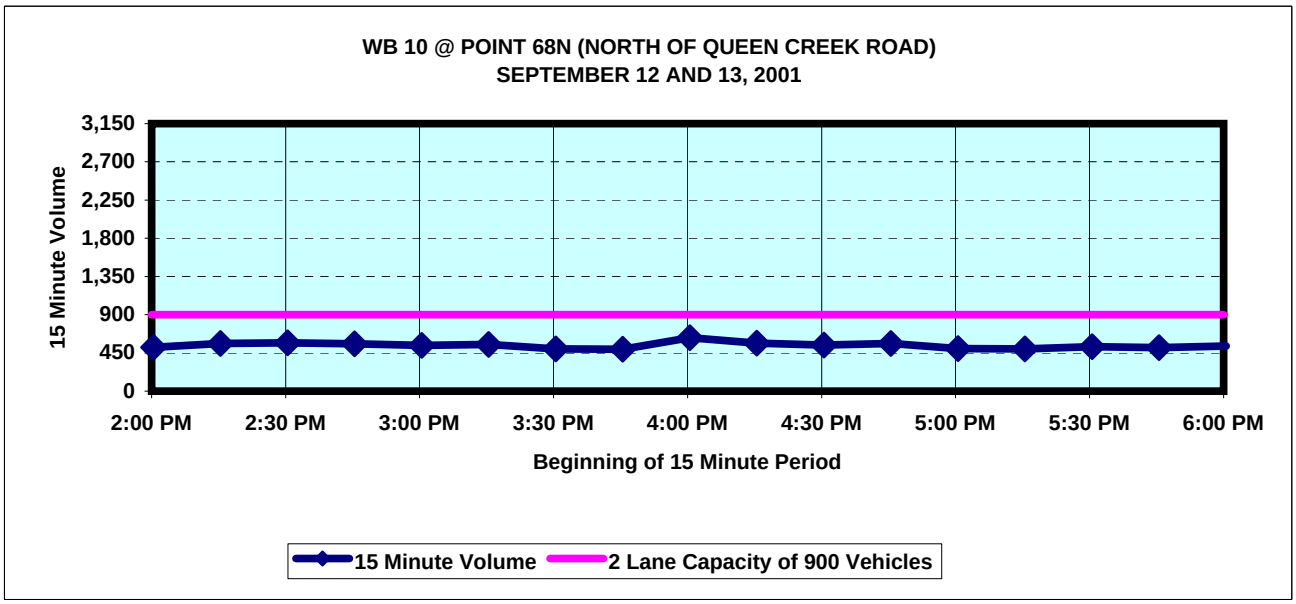

WB 10 @ POINT 45W (EAST OF OGLESBY ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
5:45 AM
6:14 AM
6:43 AM
7:12 AM
7:40 AM
8:09 AM
8:38 AM
9:07 AM
9:36 AM
15 Minute Volume
2 Lane Capacity of 900 Vehicles

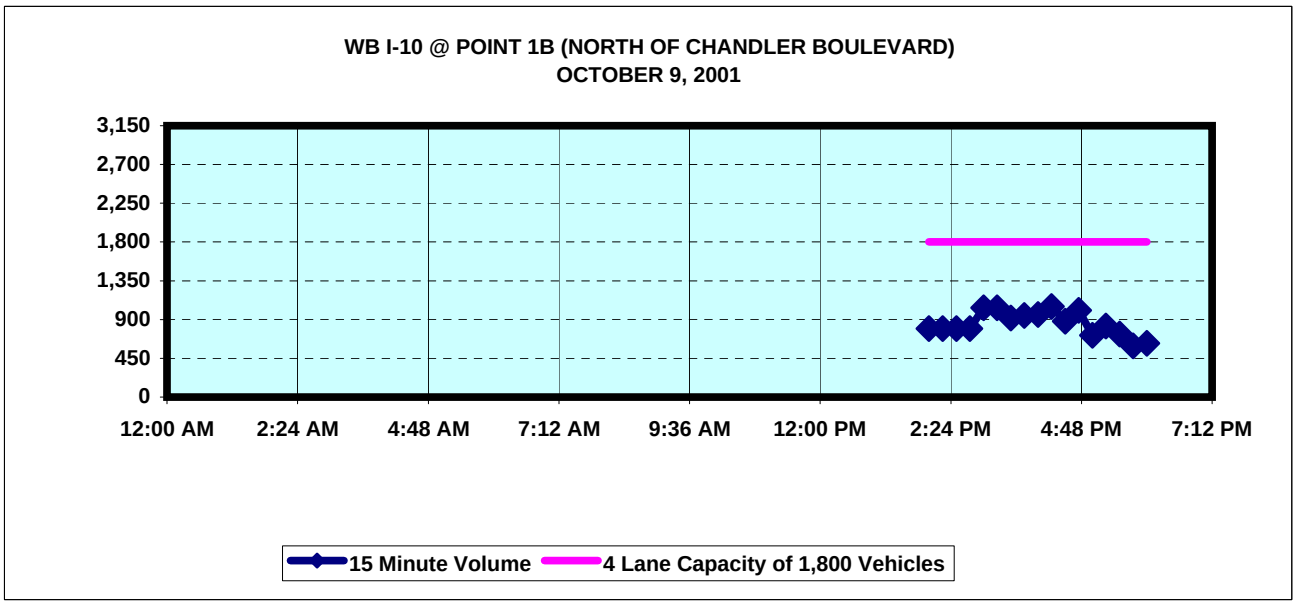
APPENDIX F

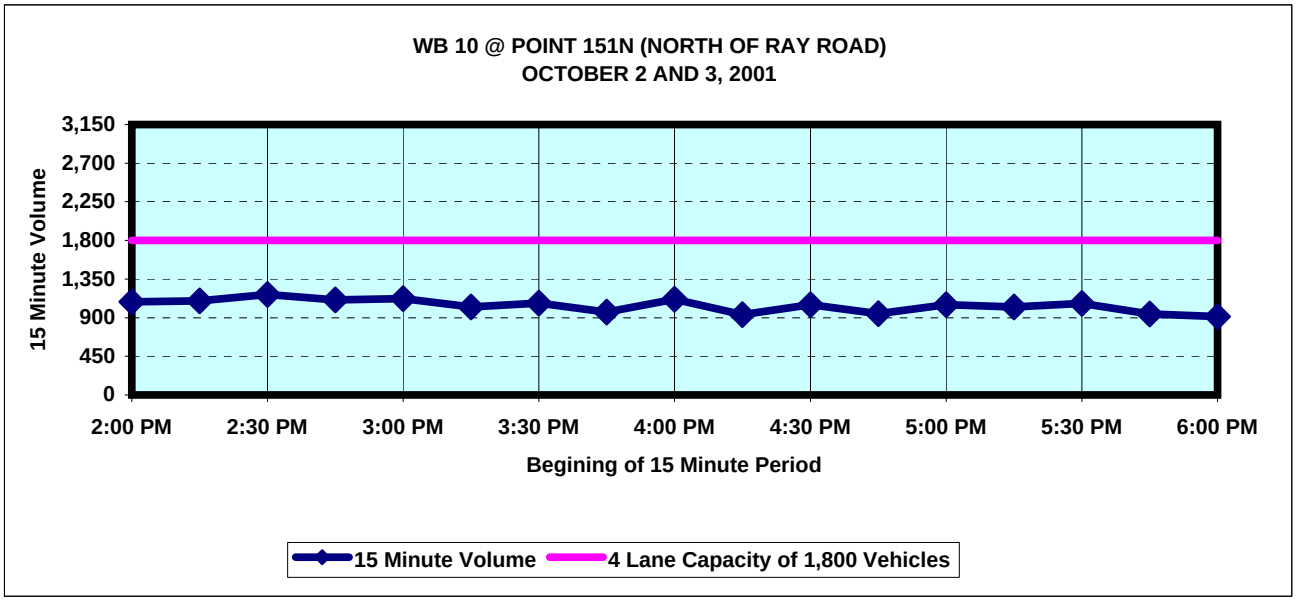
I-10 WESTBOUND
PM PEAK TRAFFIC VOLUMES

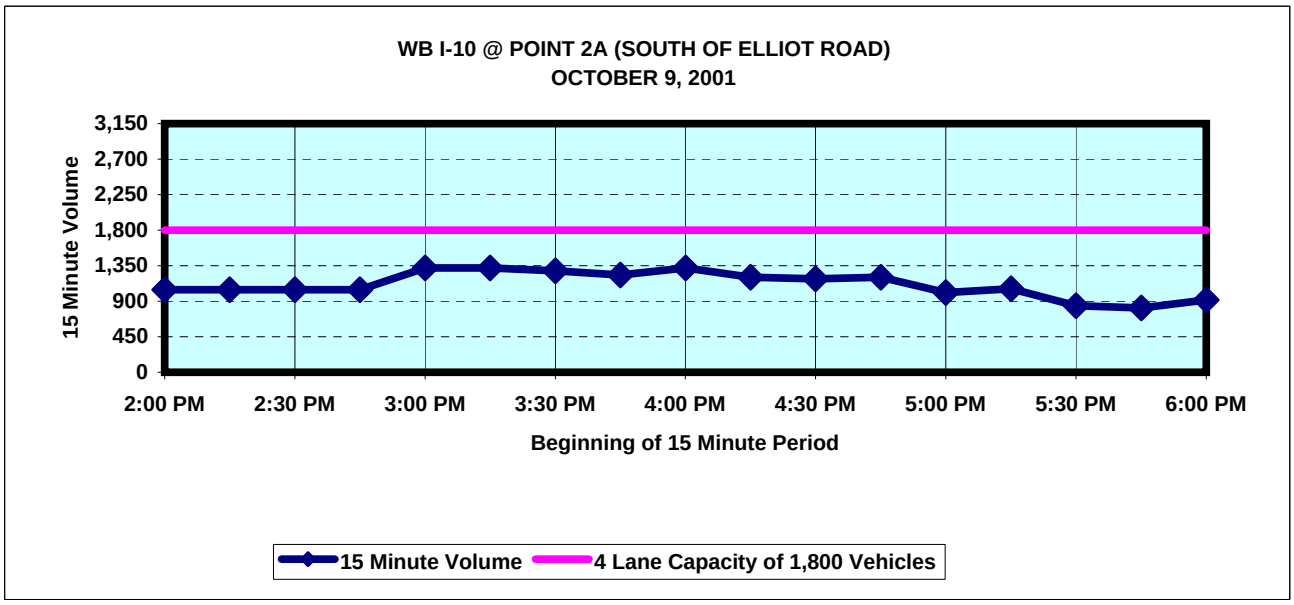
A

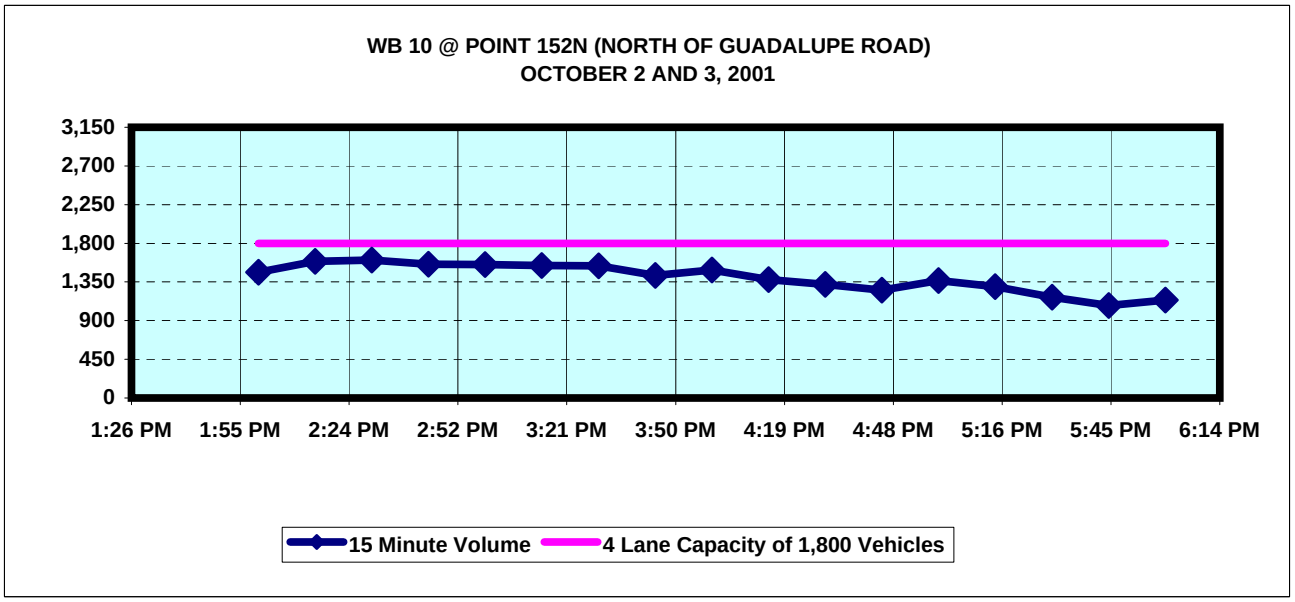

WB 10 @ POINT 69N (NORTH OF RIGGS ROAD)
SEPTEMBER 12 AND 13, 2001
15 Minute Volume
3,150
2,700
2,250
1,800
1,350
900
450
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
Beginning of 15 Minute Period
15 Minute Volume
2 Lane Capacity of 900 Vehicles

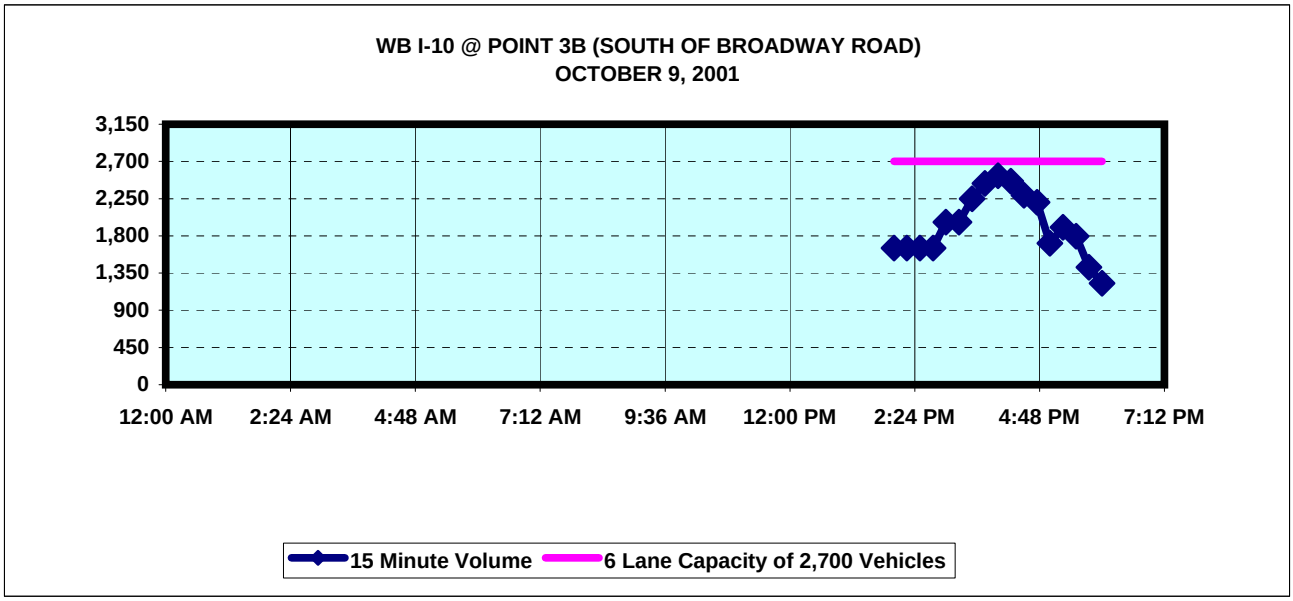

WB 10 @ POINT 68N (NORTH OF QUEEN CREEK ROAD)
SEPTEMBER 12 AND 13, 2001
15 Minute Volume
3,150
2,700
2,250
1,800
1,350
900
450
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
Beginning of 15 Minute Period
15 Minute Volume
2 Lane Capacity of 900 Vehicles

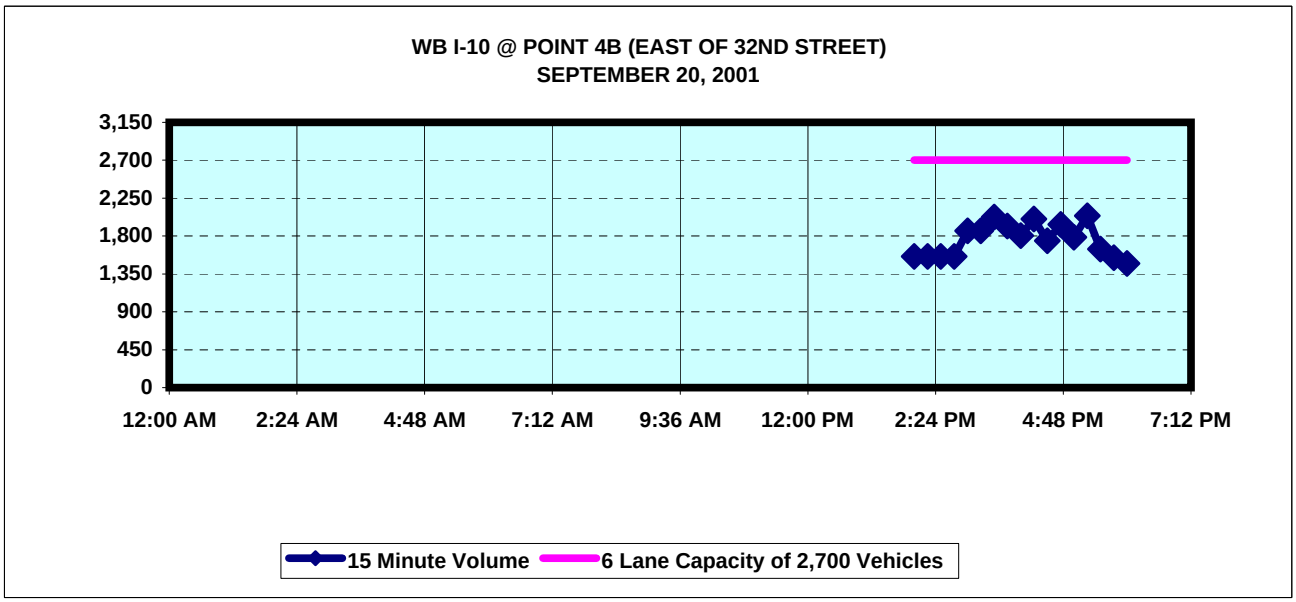

WB I-10 @ POINT 1B (NORTH OF CHANDLER BOULEVARD)
OCTOBER 9, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

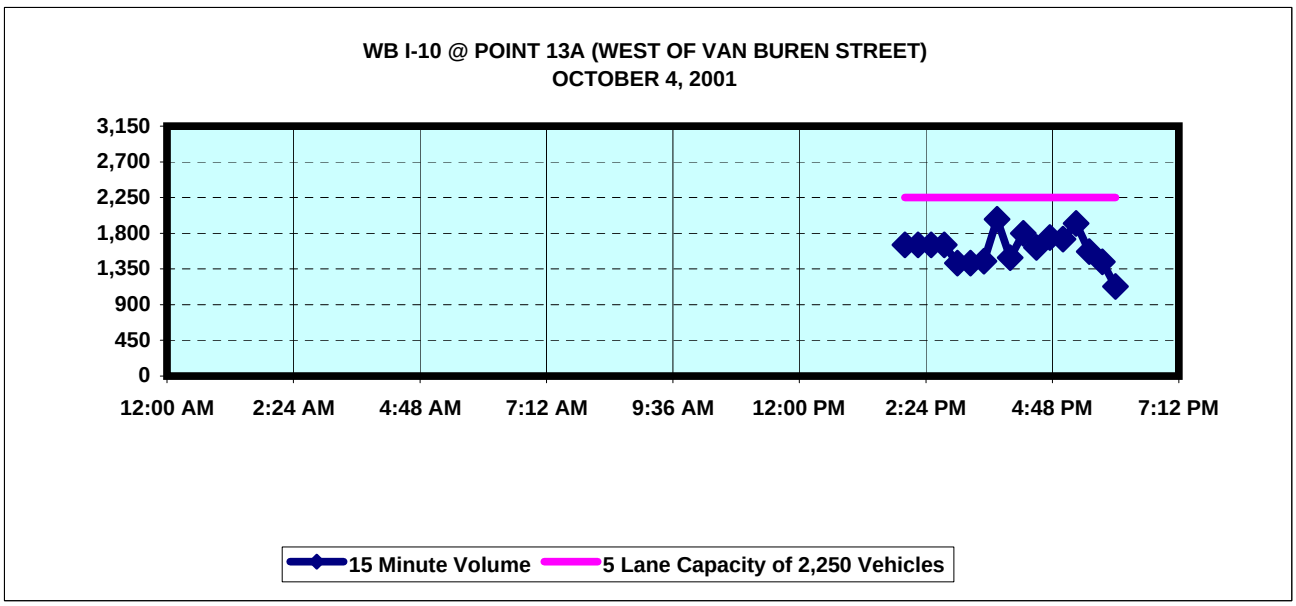

WB 10 @ POINT 151N (NORTH OF RAY ROAD)
OCTOBER 2 AND 3, 2001
15 Minute Volume
3,150
2,700
2,250
1,800
1,350
900
450
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
Begining of 15 Minute Period
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

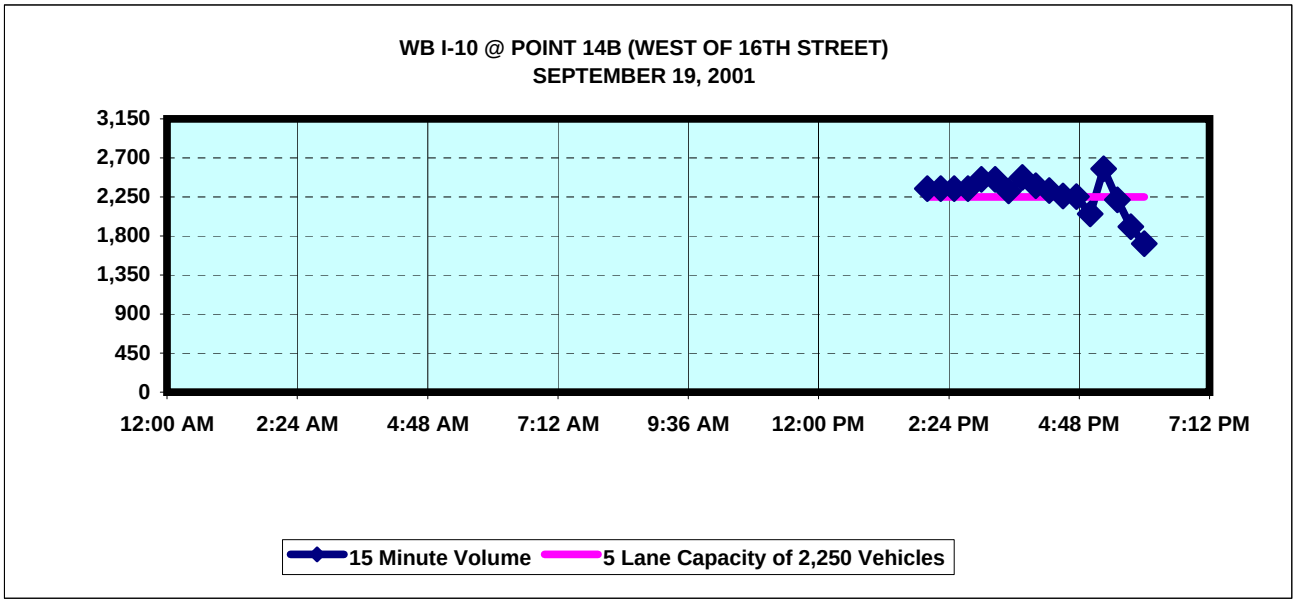

WB I-10 @ POINT 2A (SOUTH OF ELLIOT ROAD)
OCTOBER 9, 2001
15 Minute Volume
3,150
2,700
2,250
1,800
1,350
900
450
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
Beginning of 15 Minute Period
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

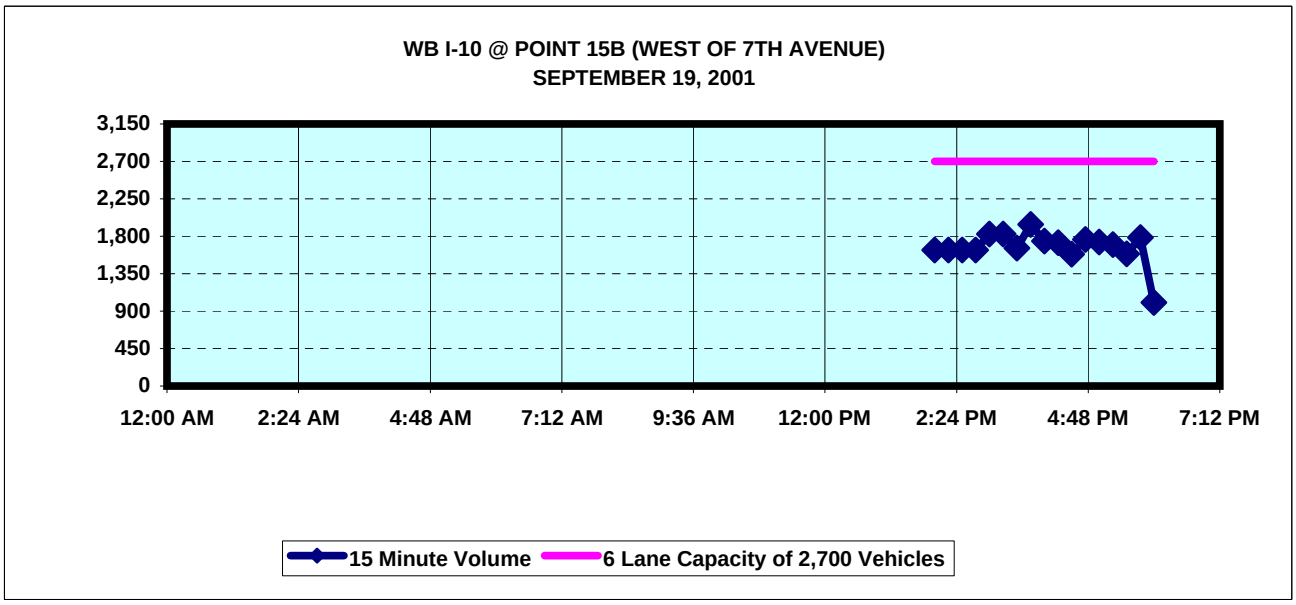

WB 10 @ POINT 152N (NORTH OF GUADALUPE ROAD)
OCTOBER 2 AND 3, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

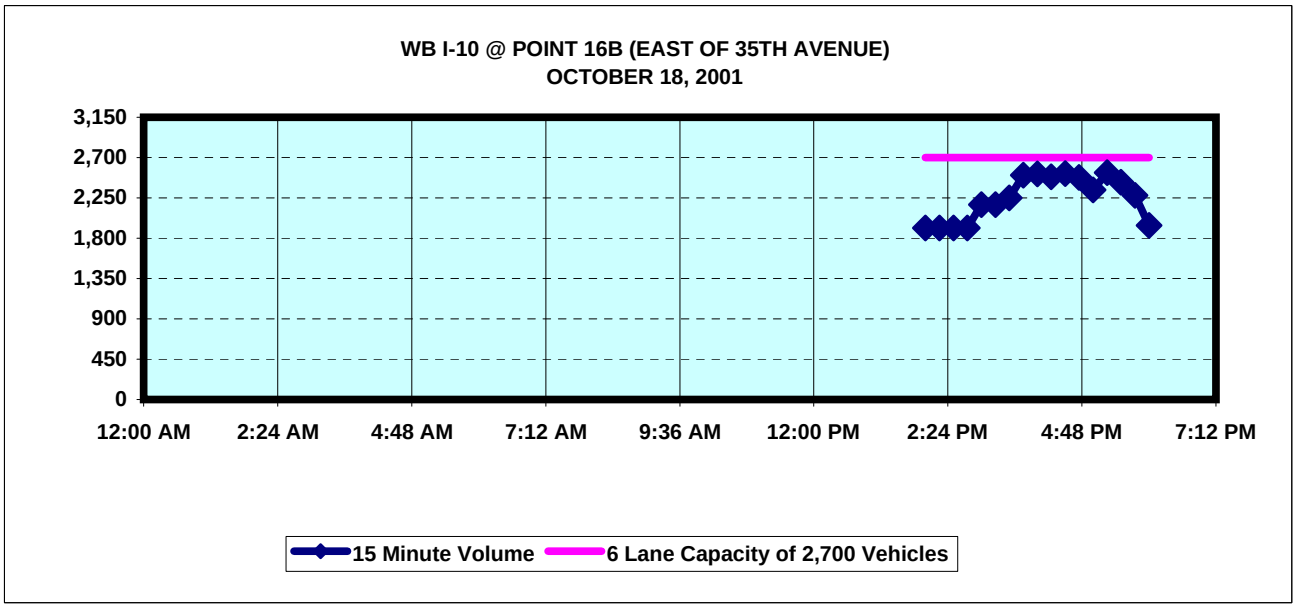

WB I-10 @ POINT 3B (SOUTH OF BROADWAY ROAD)
OCTOBER 9, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

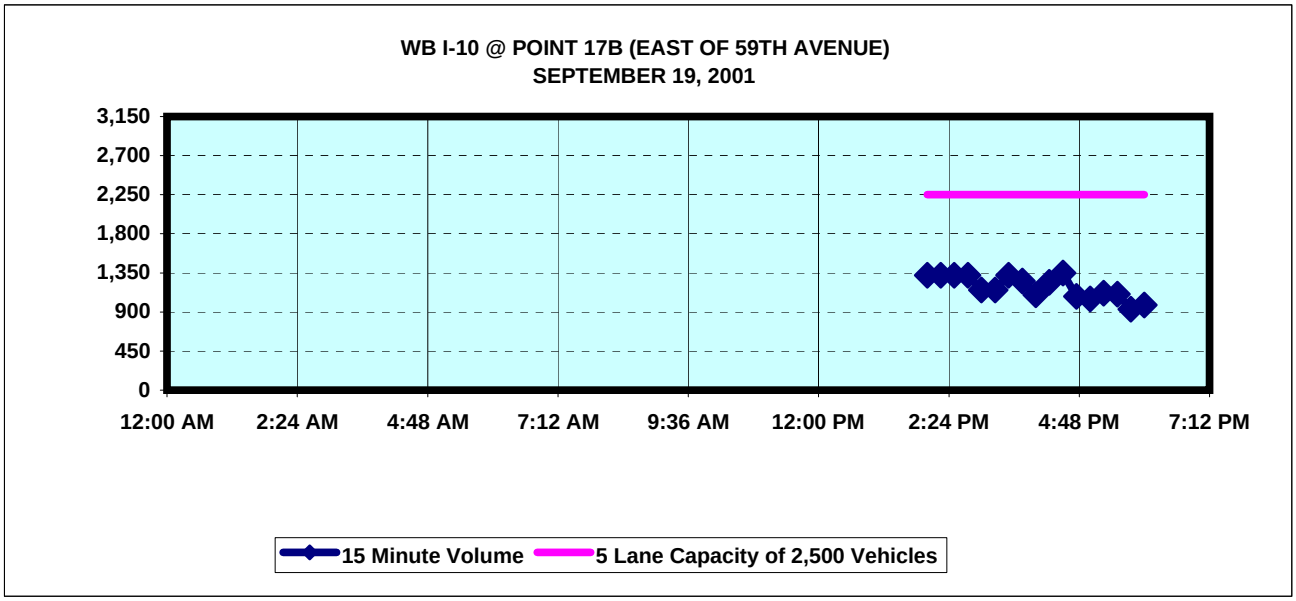

WB I-10 @ POINT 4B (EAST OF 32ND STREET)
SEPTEMBER 20, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

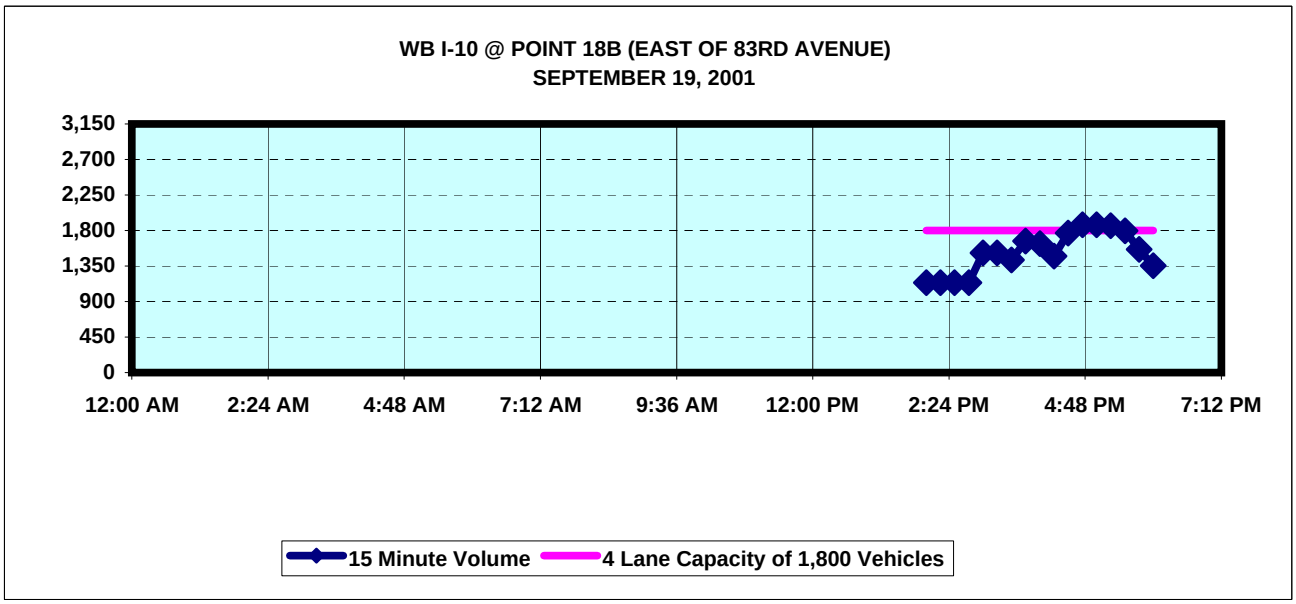

WB I-10 @ POINT 13A (WEST OF VAN BUREN STREET)
OCTOBER 4, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
5 Lane Capacity of 2,250 Vehicles

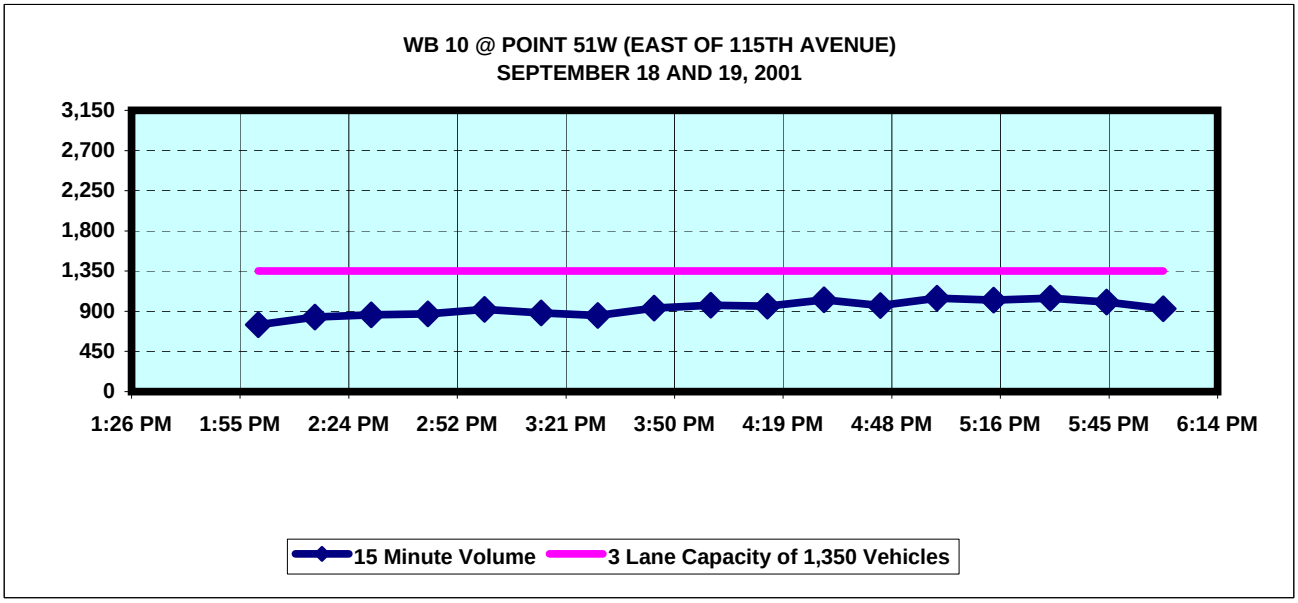

WB I-10 @ POINT 14B (WEST OF 16TH STREET)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
5 Lane Capacity of 2,250 Vehicles

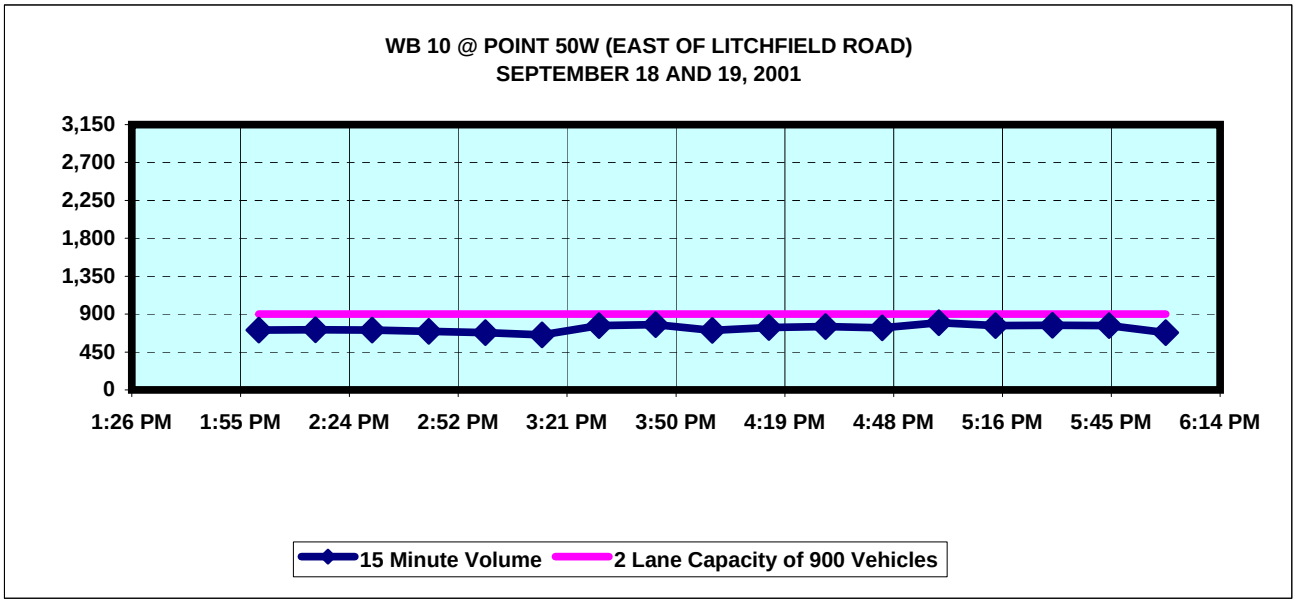

WB I-10 @ POINT 15B (WEST OF 7TH AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

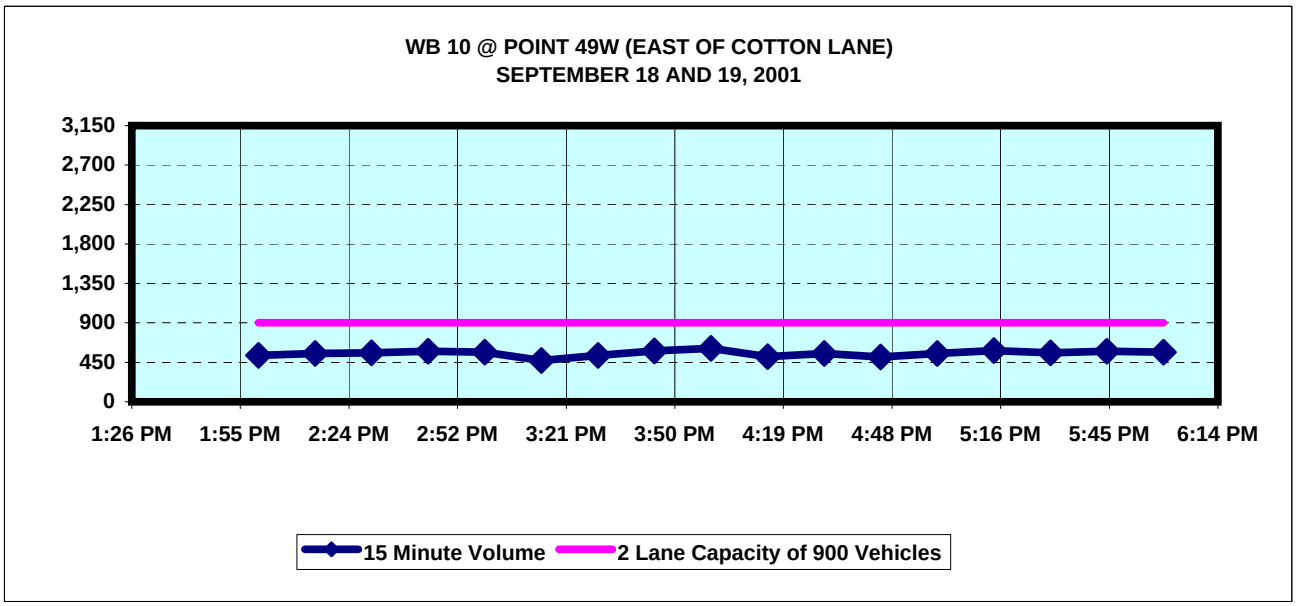

WB I-10 @ POINT 16B (EAST OF 35TH AVENUE)
OCTOBER 18, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
6 Lane Capacity of 2,700 Vehicles

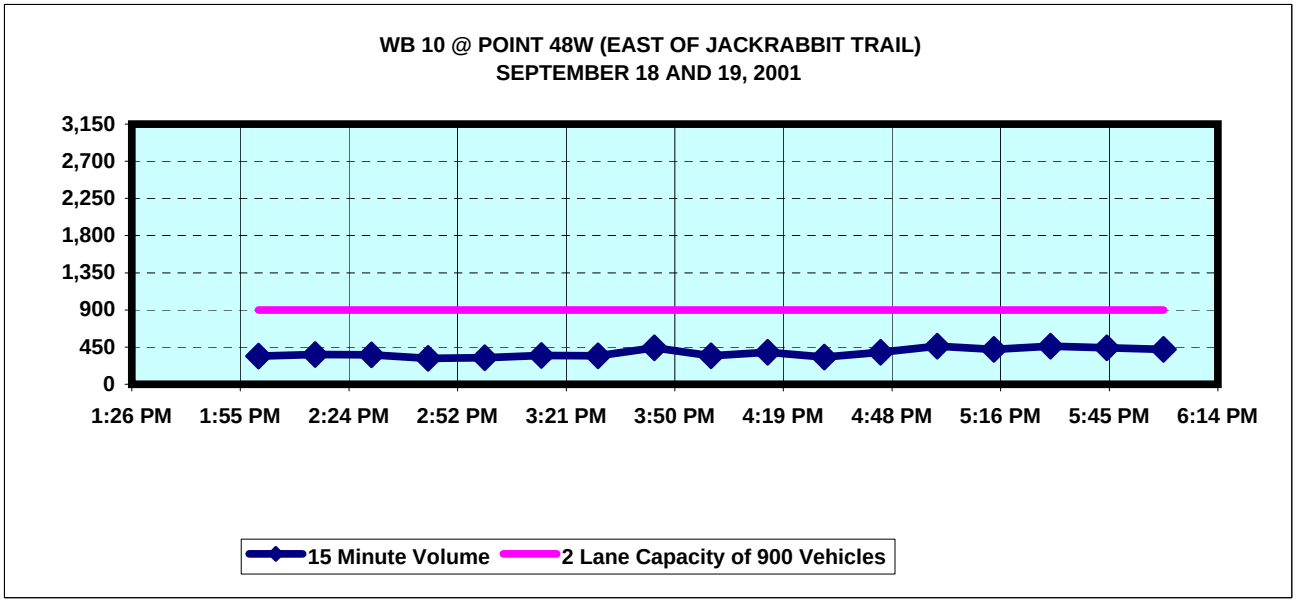

WB I-10 @ POINT 17B (EAST OF 59TH AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
5 Lane Capacity of 2,500 Vehicles

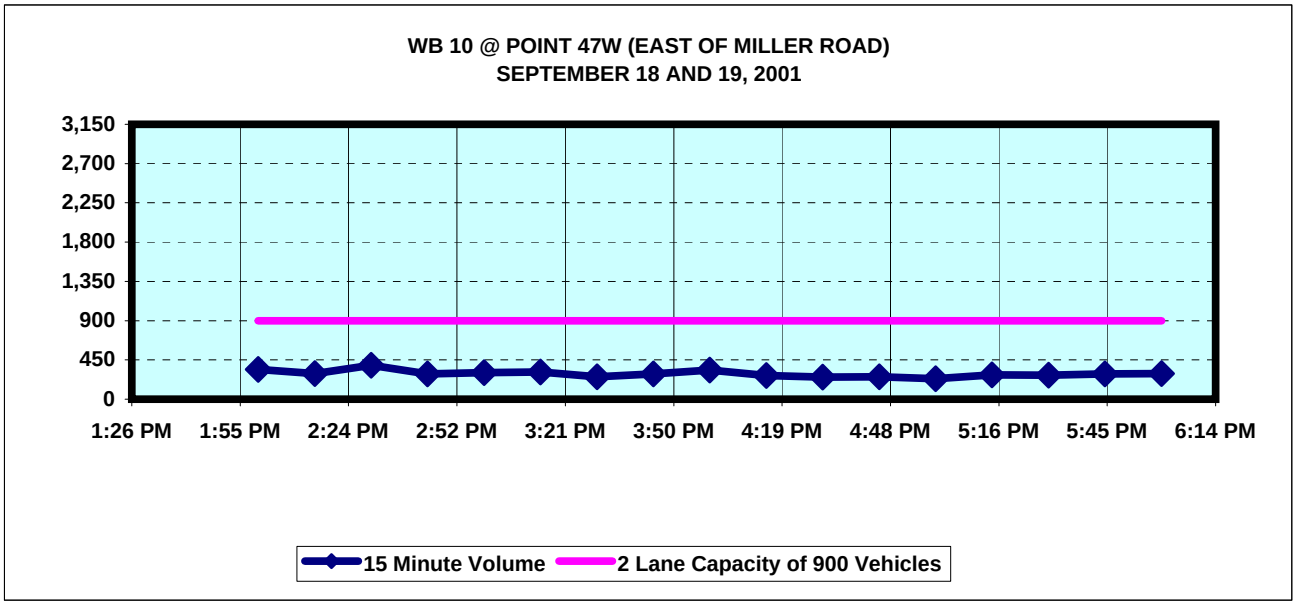

WB I-10 @ POINT 18B (EAST OF 83RD AVENUE)
SEPTEMBER 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
12:00 AM
2:24 AM
4:48 AM
7:12 AM
9:36 AM
12:00 PM
2:24 PM
4:48 PM
7:12 PM
15 Minute Volume
4 Lane Capacity of 1,800 Vehicles

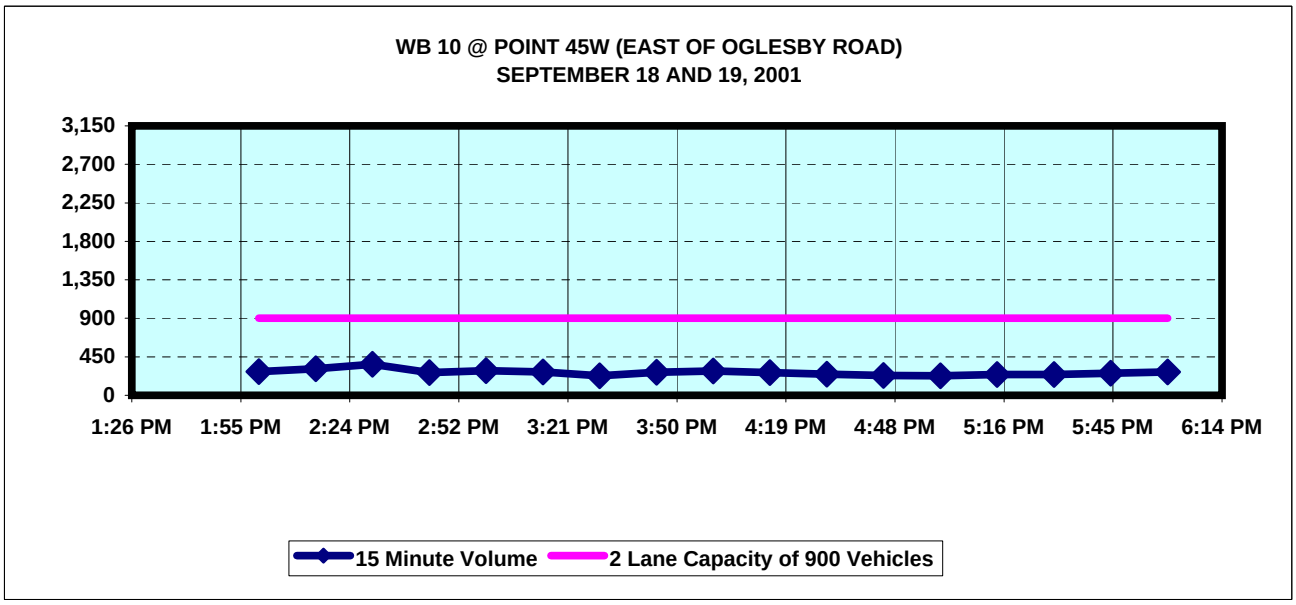

WB 10 @ POINT 51W (EAST OF 115TH AVENUE)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
3 Lane Capacity of 1,350 Vehicles


WB 10 @ POINT 50W (EAST OF LITCHFIELD ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 49W (EAST OF COTTON LANE)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 48W (EAST OF JACKRABBIT TRAIL)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 47W (EAST OF MILLER ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
2 Lane Capacity of 900 Vehicles


WB 10 @ POINT 45W (EAST OF OGLESBY ROAD)
SEPTEMBER 18 AND 19, 2001
3,150
2,700
2,250
1,800
1,350
900
450
0
1:26 PM
1:55 PM
2:24 PM
2:52 PM
3:21 PM
3:50 PM
4:19 PM
4:48 PM
5:16 PM
5:45 PM
6:14 PM
15 Minute Volume
2 Lane Capacity of 900 Vehicles